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New Year's Greetings!

TO our friends, and others, if such there be, we wish a Happy and Prosperous New Year.

The Crude Rubber Supply

ANY anxiety as to the amount of crude rubber available for American manufacturers will soon be dispelled on reviewing the figures given by reliable statisticians bearing on surplus, current output, and probable consumption. As a result of forced and voluntary reduction in acreage, to offset in some degree the evil of overproduction, we are told that the Eastern plantation output for 1921 will not exceed 200,000 tons, or but 65 per cent of the 309,100 tons produced in 1920. As the rubber industry of the United States will require, it is estimated, 242,000 tons for 1922, as compared with 229,000 tons in 1921, and as it takes about 70 per cent of the world's production, this report might well be alarming were it not for the fact that the world stock of raw rubber, according to estimates, is between 125,000 and 175,000 tons. With so much rubber still obtainable, and no extraordinary use likely to develop soon, the likelihood of a rubber shortage is quite remote. Nor must it be forgotten that the planters have their ears to the ground, that their profit lies in producing rubber, and that on the first indication of a quickening demand and firmer prices acreage restriction—a rule more honored in the breach than in the observance—will be quickly discarded and growers will again vie with one another in providing the market with an ample supply.

Synthetic Rubber Now or Never

ODDLY enough, many men in the rubber trade who are sensible enough in other respects, are still obsessed with the notion that the industry is likely at any time to get a big surprise in the marketing of a real "built up" rubber at a popular price. They still fancy that the Central European country that revolutionized the dye and drug trades with laboratory products will yet give the rubber trade a rude jolt with a synthetic caoutchouc of all-around efficiency. But they seem to overlook the fact that the odds are all against that country marketing even a small amount of such a product. When the war cut off the supply of natural rubber, chemists produced a quantity of india rubber by employing the methods used years ago by Tilden and Bouchardat for polymerizing a hydrocarbon of lower molecular weight. Sometimes reclaimed rubber was added, or other materials, to gain bulk or other advantage. With the exigencies of war no longer a deterrent, the thrifty Central European rubber manufacturer now buys, not the costly homeland laboratory product, but the cheap *gummi* from Malaya or the Amazon, which serves his needs even better than the substance sold by his chemists. He does not let patriotism interfere with business.

The strongest argument against synthetic rubber is the commercial one; it cannot be produced cheaply enough. How could it hope to compete with plantation rubber when the latter can be delivered in practically unlimited quantities for from 15 to 25 cents a pound? In contrast with nature's laboratory, the works process involves the employment of fuel, chemicals, transportation, white labor, etc., apart from heavy overhead charges. On the other hand, grown rubber is produced on plantations, relatively cheap to establish, that are operated with low-cost coolie help, and the fuel for which is the heat of the tropical sun. Indeed, growing conditions have been so favorable that the supply of crude rubber has considerably outrun the world's demand, and it was found necessary to devise means for curtailing production to a point nearer current needs.

The problem of producing rubber cheaply has been solved by the planters. When, in addition to using their practical knowledge to the utmost, they will also conduct culture and marketing on the most scientific lines, they may well smile at the prospect of competition from makers of synthetic rubber. By the same token, if the

latter cannot be made a commercial reality now, the chances are that it never will be.

Akron and Decentralization

THE President of these United States in a recent message to Congress advises the decentralization of industry. As he is an Ohio man, was not his thought of the busy city of Akron? The Rubber City is the most centralized rubber production spot on this round earth. Drawn to Summit County by central location, favorable transportation and cheap fuel the rubber companies have increased and prospered tremendously. Yet the rubbing of elbows of rival interests has its frictions and dangers. For example, the privacy that rubber experimenters love is difficult in so crowded a center. It will be recalled that the pioneer accelerator, aniline oil, was first tried out in secret in an Akron mill, and that within twenty-four hours a vial was submitted to a local druggist to determine its name, characteristics and source. Also, when Arthur Marks began extracting rubber from Pontianak in an isolated, fenced, carefully guarded plant, it was but a short time before the back yards of his rivals were cumbered with Pontianak resin.

To be sure, the vigilance entailed by able competitors results in extra alertness and sharpens the faculties. Moreover, commercial necessities work toward decentralization even in Akron. Companies get away from the home city as do individuals. They may pass to the great beyond as did the Alden Rubber Company; or move their plants like the Kelly-Springfield to Cumberland; the Faultless to Ashland; the India Rubber Company to New Brunswick. Or they may stay where they are but pass into the control of outside interests as the Alkali to the Philadelphia Rubber Works, and the Goodrich Hard Rubber to the American Hard Rubber Company of New York. Or they may erect supplementary plants at other points to make goods nearer distant markets, as the Goodrich factories in France and Japan, the Goodyear in Los Angeles and the Firestone in Hudson, Massachusetts.

Thus it would appear that when it is necessary or profitable, the rubber industry is not opposed to decentralization. Akron's future as a rubber city, of course, no one can predict, but there is at present no sign of a general hegira.

Burdensome Tire Specifications

A PROMINENT tire manufacturer in a letter to the Editor of THE INDIA RUBBER WORLD makes the following appeal:

"The greatest extravagance from the viewpoint of the parts manufacturer is the constant changing of specifications. This results in the case of the tire manufacturer in a general scrapping of molds and cores. The old-time complaisance to demands for first one size tire and then another has led the car manufacturers to believe that changes were of little consequence to the tire manufacturers, that their profit was so great that they could well afford to do it, else why agree so willingly?"

The fact is, there is not today a tire plant in the country that has been in operation five years that has not thousands of dollars tied up in idle equipment. Idle, only because the car designers changed specications. Moreover, there is not a tire plant that is not figuring on investing more thousands of dollars for equipment to meet the latest changes in specifications; planning to make this expenditure with the knowledge that in all probability by the time when they have their equipment orders completed the car manufacturers' specifications may change again.

Should not tire manufacturers appreciate that they are in a position to refuse changes? Their reputations are established, they have their organizations; they know their costs and production limits; and the car manufacturers are absolutely dependent upon them.

It is a recognized fact that the selling price of cars must be reduced. If the tire manufacturers could feel sure that their equipment investment was going to be a live investment they could sell their product at a lower figure. Lower cost price for tires means a lower cost price for cars.

When would be a better time than now for the tire, rim and wheel manufacturers to get together and really agree to produce only certain sizes for certain weights of cars? To agree not to accept contracts for other sizes and to refuse to make any changes in size standards for five years.

If it has been possible in the past for shoe manufacturers, cotton manufacturers and paper manufacturers to agree and live to their agreements on standard sizes for their products, to the benefit of all, are not the rubber operators big enough to do the same?

THERE ARE THOSE WHO ARGUE THAT IT IS REAL charity, as well as good business, to buy freely from war-worn countries. They say that it helps them to get on their feet and that later they will reciprocate generously. Undoubtedly they will return the favor,—if they see an advantage in it. Recently a cargo of 3,000 tons of toys arrived in Boston from Central Europe. Here were goods that could be made much better and nearly as cheap in this country, but insufficient tariff protection and foreign valuation make it impossible to produce such articles here and give thousands of fellow-countrymen urgently-needed employment. It is all very well to be altruistic, but good sense and real patriotism still dictate that charity should begin at home.

Planning Rubber Footwear Production

Only a Beginning Has Been Made—The Question of Quality Is Still in the Workman's Hands

THE rubber footwear industry, owing to its dependence upon the weather for at least sixty per cent of its volume, requires close coordination between sales and manufacturing departments to insure efficient production planning.

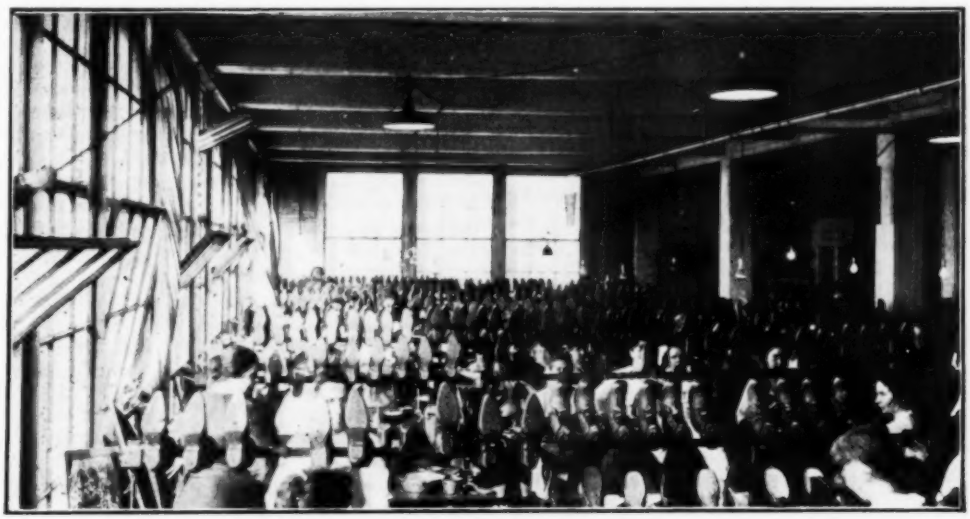
Seasonable Considerations

There is always enough rainy weather in some parts of the globe to assure a fairly steady demand for light rubbers and arctics, and enough mines, creameries, ice houses, and fire departments to create a scattering demand for heavier footwear, such as boots and lumbermen's. But for the large volume which is necessary to carry the overhead and show a profit, a good old-fashioned winter with plenty of snow and slush is needed. The other extreme is true of the tennis or canvas shoe end of the business. An early spring and a hot summer is a great boon to the "sneaker" trade. Thus if the rubber footwear manufacturer had control of the weather, we would always have a snowstorm before Christmas and some warm sunshiny days before Memorial Day.

Variety of Rubber Footwear

Large corporations have the advantage in being able to centralize the manufacture of one class of footwear in a separate plant, whereas independent plants are obliged to make the whole line in one mill. The following list will give a general idea of the extensiveness and variety of the rubber footwear line: light gum shoes, sandal and storm, made in men's, women's, boys', youths,' misses' and children's, for ordinary rainy weather, a varnished, stylish product sold generally by the retail trade in cities and towns; heavy gum shoes, made in men's, boys,' and youths', usually dull-finished, unvarnished, pressure or steam-cured, for men engaged in walking occupations such as policemen, and postmen—built for wear and not for style; lumbermen's overs, heavy uppers with or without heel, with leather tops attached, made for woodsmen and lumberjacks, to be worn as a shoe with a heavy woolen sock; pacs, heavy 4, 5 or 6 eyelets, a rubber shoe worn the same as a lumberman, used by miners, workers in creameries, farmers; rubber boots, all varieties, for the city laborer, garage man, fisherman, hunter, children who play in the snow, and workmen in countless industries; arctics and gaiters, light dress overshoes for city wear; heavier varieties with rubber as well as cashmerette tops for farm and country use.

Even the term "tennis shoe" covers a line which is complete in itself. These shoes are worn by Y. M. C. A. and gymnasium students, Boy and Girl Scouts, college and professional basket-ball players, summer recreationists, and by children as a substitute for the leather shoe in summer.



Making Department of a Rubber Footwear Factory

Manufacturing Seasons

The manufacturing season on gum-shoes, lumbermen's, boots, and gaiters starts in mid-summer for the winter goods. New samples are gotten out in the late spring after the results of the previous winter's sales and tests have been analyzed. Rubber footwear manufacturers test their products in actual service as much as the tire industry, and while adjustments are not so common nor so extensive in volume, they are present, nevertheless, and watched very closely.

Production proceeds at an increasing rate until the peak is reached in December. Then something always happens. If the looked-for snowstorm has arrived, the manufacturers reap a harvest on repeat or "sizing-up" orders which have been anticipated by making for stock. If, on the other hand, the grass turns green in January, the manufacturer is obliged to carry an inventory of footwear in his storehouse and incidentally to execrate the weather. Usually, however, with the national distribution of most companies, it works out so that wintry weather is bound to come in some sections, if not in others.

The Present Situation

Last winter was an exception in that conditions were pretty much alike the country over. This shut off production early in the winter, and the manufacturers worked off what surplus stocks they had in the rainy spring. This has left an unusual situation which may cause a shortage this winter. Owing to

financial conditions, very few plants are working on anything but actual orders and are carrying as little stock as possible. In the event of winter like that of 1919-20 a serious shortage is not unreasonable to expect. When the winter is heavy, the peak is postponed until January or early February.

The Tennis Season

Production on tennis goods starts in late August or September, after the samples are sent out. If tennis are manufactured in the same plant with gum shoes, a small daily production is usually carried until January when, as soon as the winter goods slump, the tennis ticket is increased in a corresponding ratio. Tennis usually replace arctics and gaiters pair for pair, as a fair-sized ticket on gum shoes and boots is carried the year around.

Production Planning Office

Planning production in rubber footwear can be reduced to no system nor formula. It requires the utmost in skill and canny business judgment; it is, in fact, almost like playing the stock market, this gambling on the weather. There are, however, a number of agencies in the production organization which function along the lines of direct planning.

The most important is generally known as the ticket or production planning office. It is here that the orders are received and the necessary instructions issued to the plant for producing the goods. The industry manufactures for stock as well as on order. As explained in the foregoing analysis of the line, there are certain staples which, unless carried in stock, would mean the loss of vital business in the event of bad weather. Goods that are made on order only are usually of some special design or one of a more seasonable character.

Knowledge of Plant Capacity Essential

The production planning office must, first of all, have accurate knowledge of the capacity of the plant. This is a factor that depends upon a number of divergent things. Machine capacity can be gaged by the number of sheets of soling or upper stock which a calender can turn out in a given time, making due allowance for roll changes which vary with the number of styles called for. Capacity of mixing mills, lining and friction calenders, sole and heel cutting machines, beam presses, and stitching machines must be taken into consideration. Vulcanizing space and time of heats are other important items. All these factors are dependent one upon the other, and to determine the possibility of making a certain production, say 25,000 pairs a day, none of them must be neglected. The maximum capacity of the plant is at the neck of the bottle, that is, the pair capacity of the smallest department.

This method of predetermining an exact day's production and aiming at making it, no more or no less, is quite different from the leather shoe factory methods. But the selling price of rubber footwear is so far below that of leather that it is only by bulk and mass production, planned out beforehand, that efficiency can be obtained.

Last Equipment

Lasts or wooden and metal trees on which the shoes are made are very expensive and have to be changed frequently owing to style requirements. They very often prove to be the neck in the production bottle, especially if work becomes tied up or delayed. If, for example, the plant is equipped with 600 pairs of lasts on a certain style of child's tennis shoe, the maximum daily capacity of the plant on this style will be as many times as these lasts can be put through a heat, stripped, and returned to the making department; probably not more than twice, or 1,200 pairs daily capacity.

Labor Supply

The question of labor supply comes in for a large share of attention in rubber shoe production planning. In preliminary processing, such as mixing, calendering, cutting, cementing, etc., one cutter or calender man can cut or run stock for one shoe as well as another. But in the making departments, where the shoe is actually built over the last by hand, operators are usually skilled in one kind of work only. Women are employed to make gum shoes, light gaiters, and the cheaper and lighter grades of tennis. Men make boots, lumbermen's, heavy gum shoes, basketball and tennis shoes. This explains the advertisements for gum shoe or tennis makers seen frequently in the papers. When the planning department finds it has a certain type of shoe to make, the first step is to get in touch with the industrial relations manager and the making department foreman to procure the kind of maker needed.

Detailed records are kept of the capabilities of makers of all kinds, both men and women, and it is the constant endeavor of the planning department to furnish a steady flow of production which will keep the makers employed at the work for which they are best fitted.

Planning-Office Instructions

The amount of printed instructions issued to the plant from the ticket office depends a great deal on the methods used in the plant. In the old days a sheet was issued giving the number of pairs to be made on a certain date, and it was up to the department foremen to guess how much stock to calender and cut. It certainly is not to be wondered at that under such conditions there was always a generous supply of black cloth left over after the end of the gaiter season, with its accompanying waste of labor and material.

Today there are very few plants which do not control all operations from the central planning office. This must be more than paper control, however, and will produce the best results only when backed up by close supervision and constant inspection.

The Master Ticket

This control is based on the master ticket, which gives the name of the shoe, last number, width, kind (men's, women's, etc.), and number of pairs of each size to be made on a specified date. This ticket may contain anywhere from 50 to 100 different styles grouped in brackets. It is issued approximately four days before the shoes are to be made, the time varying slightly in different plants according to the scheduling system in use. But it is advantageous to cut down the time as much as possible owing to greater flexibility—whereby an increase or decrease in production can be put into effect quickly.

Department Orders

From the information in the master ticket the various instructions to departments are drawn up. Some, such as cutters' tickets, consist of mere parts of the ticket distributed in the same manner as a newspaper story is split among five or six linotype operators to save time. The ticket office must be supplied with such data as compounds, construction of shoes, weights and styles of fabric, case and carton specifications, and a list of operations complete.

Numerous Tickets

The list of orders made up for the mill can be classified as follows:

1. Mixing ticket. Number of batches of various compounds needed.
2. Cement ticket. Number of gallons of different compounds.
3. Upper ticket. Engraved and plain. Number of sheets, for example, 28 sheets men's sandal roll, compound 1141.
4. Outsoling ticket. Number of boards or sheets of soling classified by trade marks or medallions and compounds.
5. Cloth cell drier ticket. Yards and kinds of cloth.
6. Rag ticket. Number of yards and gage.
7. Insoling ticket. Number of yards, color, style of sheeting, gage.

8. Filling ticket. Number of yards, gage, kind of sheeting.
9. Friction ticket. One or two sides, compound, name of fabric, number of yards.
10. Linings. Weight, yards, color of fabric, running specifications, compound for coat.
11. Molded goods. Number of blanks to cut, sheet stock to run, number and kind of heels to mold.
12. Cutters' tickets. (1) uppers; (2) outsoles; (3) fillers, juniors, cloth heels, insoles; (4) linings, toe and leg; (5) heel pieces, heel lifts; (6) toe strips, toe pieces; (7) tennis vamps, quarters, linings, tongues, stays.
13. Sole table tickets. Assembling sole, form and heel.
14. Preparatory tickets. Cementing, joining, picking.
15. Transportation orders. Moving stock from one department to another.
16. Stitching room routing tags. List of operations necessary on each part—hemming vamp, top stitching, closing, etc.
17. Making tickets. Individual groups of pairs given to makers for checking purposes.
18. Last bin tickets. Orders for lasts to be delivered to makers.
19. Varnish ticket. Number of varnished shoes, machine and hand.
20. Vulcanizer tickets. Heat specifications, grouping of shoes on cars, temperature specifications.
21. Packing and shipping mating cards. Instructions for packing in sizes or runs and shipping destination.
22. Carton and case order on box factory.
23. Miscellaneous requisitions on central stores. Buckles, hooks, ladders, boot webbing, leather, labels, thread, binding, etc.

Purchasing the Materials

A file of the above plant orders over a stated period gives to the purchasing department a foundation of knowledge on which to base purchase orders for raw materials. Better still, the purchasing agent should be well versed in the manufacturing end himself. To buy rubber materials intelligently, he must know the compound requirements and be able to translate a ton of whiting into cases of shoes. On special orders it is often necessary to figure out the exact yardage of cotton material needed, and then to see to it that the estimated yield is obtained if possible. Here the cooperation of the plant superintendent must be enlisted, as, for example, the failure to stretch stockinette to the best width in winding might mean the loss of several pairs per yard in yield and subsequent repurchase of material where with sufficient care the original purchase would have been sufficient.

In Conclusion

There has been a feeling in recent years that it is possible to have too much planning, but in reality only the beginning has been made. The workman has been given his tools, and told what to do, but the question of how he does it, and the quality of the product, is still in his hands.

GOOD TIRE ADVICE

Before placing the car in storage for the winter, the motorist should follow a few important rules to insure the tires being sound in the spring.

In the first place the tires should be cleaned thoroughly to remove oil and grease, then remove them from the rims, deflate and wrap them in paper or cloth and store in a cool, dry place away from sunlight.

If it is too much trouble to remove the tires, jack up the car, deflate the tires, and wrap them in covers of paper or cloth. Do not let the car stand on the tires all winter or a new set of tires will be needed in the spring.

It is essential that tires be deflated. In cold weather an inflated tire has a tendency to "set"—a condition under which the rubber is likely to break if bent or twisted out of the position or shape in which it has stood for a length of time.—United States Tire Co.

RUBBER PONTOONS FOR SALVAGING WRECKED VESSELS

There has been patented[1] a resilient, collapsible rubber pontoon designed for use in raising sunken ships. One of these pontoons resembles a huge foot ball when inflated and is capable of being rolled up like a big rug for transit. It comprises three concentric casings that are spherical in shape. The inner one, which is provided with an air tube for inflation, is made of heavy sheet rubber. This is covered by a casing of heavy waterproof can-

The Saliger Resilient Pontoon

vas and the latter is protected by a close netting of manila rope which distributes the strain of the air pressure within, and the lifting strain without.

The rubber and canvas coverings are clamped together between washers and bolt heads by means of nuts. Patches are sewed on or otherwise attached to the canvas casing and straps or handles are formed by slitting these patches, serving as points for attaching the rope net covering. The latter is made in segmental sections which are laced together, completing the spherical covering with two circular polar sections.

The pontoon is equipped with suitable tackle for attachment to any weight to be lifted. The weight of a single pontoon is about 1000 pounds and can exert a lifting power of 25 tons in the water.

The salvaging equipment includes, beside pontoons, a "mechanical mole," which, guided by an electrical control-board on the work-boat above, burrows under the wreck, performing many functions hitherto possible only to the human diver. The collapsed pontoons are sunk about the hull and attached to the keel and pumped up, and bring the wreck to the surface on cushions of air.

These enormous rubber balls were used to raise from the ocean bottom the "Isis," one of the ships of the United States Geodetic Survey, that was wrecked near Anastasia Light, off the Florida coast.

[1]United States patent No. 1,384,094.

THE CHICAGO NATIONAL AUTOMOBILE SHOW, WHICH, FROM January 28 to February 4, will follow the New York Exposition, represents the twenty-second occasion of this kind held in the western city. The promoters are bending all their energies to making this show a successful one, and in many respects this coming exhibition bids fair to surpass those of previous years.

Armament Limitation and the Rubber Industry

Gains and Losses by Reason of the War

To no other industry is the reduction of armaments of more significance than to the rubber trade. It fell to the lot of rubber to assume war-time handicaps and undergo experiences in the World War which were as trying as they were unique in manufacturing history. It can be truly said of the industry in the Allied countries that it did even more than its "bit" for the cause of World Democracy; and while it is true that other essential industries also suffered seriously as a result of the war, it is doubtful if any sustained as great a direct loss as the rubber trade in proportion to the amount of capital invested or the number of persons employed.

But although the rubber trade unquestionably suffered severe losses as a result of war obligations which it assumed, it cannot be denied that it recorded certain distinct gains. The losses were direct—the net direct losses by far overbalancing the direct gains. It is quite probable, however, that the indirect gains may, in the end, more than compensate for the direct losses. Indirect gains will be slow of realization in actual money and it may be years before they will be able to balance the loss account.

No attempt has heretofore been made to tabulate and classify these opposing sides of the ledger. At best, any estimates of the kind would produce approximate results only. There are, however, certain figures which can be brought out with more or less accuracy, and for this purpose two comparative tables have been prepared. The first discloses an estimate of the direct gains. It is quite probable, however, that the indirect gains which are capable of being expressed approximately in dollars; tangible items of gains and loss. The second presents the intangible gains and losses—items which cannot now be expressed in terms of money but which seem to carry on the side of gains a preponderance of evidence that, in the end, the rubber industry will not suffer by reason of its war activities, costly though they may have been at the time.

Tangible Results

Gains		Losses	
Gain by reason of increased trade with non-European nations; five years	$50,000,000	Loss of capital now tied up in war bonds, etc.	$80,000,000
Gain by reason of war advance in prices	50,000,000	Loss by reason of charitable contributions	20,000,000
Gain by reason of increase in manufacture of a great variety of war goods	100,000,000	Loss of capital through increased direct taxation	50,000,000
		Loss through increased cost of materials	100,000,000
		Loss through inefficiency of war-time labor	100,000,000
		Loss in productive capacity due to absence of 30,000 skilled and unskilled workers	100,000,000
		Loss by reason of deflated prices of materials	100,000,000
		Loss in services of executives while engaged in war work at Washington	10,000,000
Total	$200,000,000		$560,000,000

Intangible Results

Gains	Losses
Closer cooperation between companies, resulting in better standardization of manufacturing practices	Loss of service of skilled and unskilled workers during the war
Development of better surgical goods, balloon material, airplane tires, accelerators	Cost of experimenting in perfecting war materials and abrupt cancellation of orders after the Armistice
Development of a perfected gas-mask	Disruption of organization resulting in overhead losses
Development of labor-saving devices	Loss of discipline due to disrupted organization
Explosion of theories: Synthetic rubber, Spring wheels	
Ending of German practice of stealing trade marks	
Development of: Americanism, Patriotism	
Development of: Commercial interdependence, National self-reliance, Appreciation of older men, Appreciation of women workers	
Development of closer affiliation with England	
Gains by reason of direct importation of crude rubber from Asia rather than through Europe	
Increase in knowledge of international commerce	
Increase in nationalization of aliens	
Discovery of the rabbit bush	

When America's war attitude changed from neutrality and "watchful waiting" to enthusiastic crusading zeal, the quick mobilization of the rubber industry was one of the outstanding features. The trade was speedily unified, private formulas were freely exchanged, and all the energies of the industry—factories at home and plantations abroad—were bent on aiding the Government. Patriotism was put above profit, and little special consideration sought, one of the greatest rubber companies in the country asking for the exemption from conscription of only seventeen men, all highly-trained specialists whose war service was invaluable.

In order to aid the Government in surveying the manufacturing operations of the country and quickly coordinating all of its productive agencies, numerous executives whose value to the rubber industry was indicated by their salaries of from $5,000 to $100,000 a year, placed their services at the disposal of the Federal authorities gratis during the war period, even though the loss of such leadership meant to their industry a tangible sum which has been estimated as high as $10,000,000.

Helping to Finance the War

When the call came for funds to finance the war the rubber trade was found in the forefront. It was rivalled only by the larger industries in the first and second Liberty Loan drives, and in the third loan drive the rubber industry in the New York district won the honor flag by subscribing $5,740,800 for its $5,000,000 allotment. In the fourth drive the New York division alone raised $10,775,050 and the New England division $4,845,400. In the fifth drive New York rubber men raised $5,911,550. One estimate puts the rubber industry's war bond holdings at $80,000,000. Nor was the rubber trade outdone in generous subscriptions for War Savings Certificates, Thrift Stamps, and in donations to the Red Cross, Salvation Army, Y. M. C. A., K. of C., Belgian, Armenian, Russian, and German relief, and various other war charity enterprises, not to mention gifts of ambulances, hospital equipment, sporting materials for soldiers overseas, etc., all involving the diversion of a vast amount of productive capital representing fully $20,000,000.

For the naval and land forces the rubber industry in 1917 and 1918 contributed fully 30,000 of its 350,000 employes. The

passing of so many into active war service meant a loss in production of approximately $100,000,000 annually, equal to one-sixth of the 1916 output, as the workers who volunteered or were conscripted were nearly all trained, able-bodied young men rated as exceptionally high producers. A large proportion of those who went into active war service were also foremen and factory specialists.

One of the gravest problems facing the Government was the transportation of men, munitions, etc., over the broad expanse of the States to the Atlantic seaboard. The steam railroads proved inadequate, but the tire manufacturers came quickly to the rescue. By working night and day and offering bonuses and generous wages they soon had great fleets of motor vans and lorries equipped for the severest kind of service; and fighters and materials arrived at the piers faster than ships could take them away.

Hard Hit by Extra Costs

Many industries received direct or indirect premiums on the production of war supplies, but the rubber industry lacked this advantage. A great increase in extra wages had to be paid in order to retain or attract workers who were being lured away by offers of extravagant wages in plants that sprang up almost over night to execute great and highly profitable war contracts. Then, too, the rubber industry had to contend with steadily-rising prices for nearly all materials which enter into the production of rubber goods which, if stated in terms of money might reach as high as $100,000,000.

Almost immediately after the war started in Europe, Great Britain declared rubber to be contraband, and as it controlled 71,000 tons of the 120,000 total world production of crude stock, this meant something serious to the United States which required 60,000 tons. The Brazilian supply of 37,000 tons soon doubled in price, and the 12,000 available from other countries could be had only at largely increased figures.

Relief was finally afforded United States manufacturers through an arrangement made by The Rubber Association of America. The British Government told the Americans that if they would export no rubber goods except through London they could have a fair amount of crude rubber. The United States, being a neutral country, could not assent to such a plan officially, but The Rubber Association took the matter in hand and by mutual agreement bound every broker and manufacturer to export only through London, The Rubber Association dealing thus collectively through the British Ambassador at Washington. The British kept faith with the Americans, and the latter got a considerable amount of crude rubber at a fair price.

Cotton, which is used so considerably in many kinds of manufactures of rubber, was one of the first of the great staples to soar in price when the war started, and rubber manufacturers found themselves before the rapidly rising market for raw, spun, and woven cotton. One acute hardship was the British embargo on Egyptian cotton.

The chemicals used in compounding rubber grew steadily dearer as the World War progressed, the cost of many ingredients became prohibitive, and some very necessary chemicals became as rare as radium.

When the United States went to war the difficulties of American manufacturers increased. Sulphur was an imperative need of munition makers, and so the Government took control of it and allotted this great and indispensable vulcanizing material sparingly to rubber manufacturers. In 1917 the War Trade Board, through an embargo, cut down the rubber factories' ration of raw rubber under the British trade agreement to 7/16 of the 1916 purchases; and in 1918 the ration was cut to but 3/8 of the 1916 amount.

Cooperating at a Disadvantage

Although seriously handicapped in many ways, the rubber manufacturers cheerfully cooperated with the Government not only in sidetracking private orders in order to provide the urgent war needs, but readily agreed to suggestions of the War Trade Board in regard to reducing the variety of styles in rubber apparel, footwear, sizes of tires, etc., and voluntarily amplified the Government's long list of "non-essential" rubber articles on which the manufacturers had made their best profits. An especially severe setback was occasioned by the War Trade Board's order to curtail the output of pneumatic tires of 50 per cent of the production for August and September, 1917, the Government taking the position that a large proportion of automobiles were used for pleasure rather than business, which contention has since been disproved.

To keep pace with the steady increase in the cost of living during the war and immediately afterward, the rubber industry was obliged to largely augment its outlay in wages, such increase being fully equivalent to the enhanced cost of living as shown by government, labor, and manufacturers' statistics for the period July, 1914, to March, 1920, to have averaged a rise of 95 per cent. This additional outlay was far from being offset by any increase in the selling price of manufactured rubber goods.

That the war brought no undue advantage to the rubber industry is best illustrated by the fact that the signing of the Armistice found the range of prices in the trade 72 per cent below that of all commodities, or 31 per cent below the trade's own price level in 1913-1914. Yet in the same interval the prices of many other staples had doubled, trebled, or even quadrupled.

Sharp Drop in Individual Production

One of the most striking losses sustained by the rubber industry during the war period was due to the sharp drop in the production of individual workers. The falling off in individual efficiency is well illustrated in the comparative figures for 1914 and 1919:

Year	Total Output	Total No. Operatives	Average Output per Man
1914.....	$360,993,796	75,974*	$3,962
1919.....	1,145,790,000	400,000†	2,864

* United States Census Report, publication 1917, page 257.
† Estimated. (See THE INDIA RUBBER WORLD, February 1, 1918, page 271.)

Figures are not readily available on the loss sustained to the industry in perfecting war materials, in erecting experimental machinery, and in purchasing vast amounts of raw materials for war needs, orders for the production of which were abruptly cancelled by the Armistice, but the total must be considerable. Nor can exact data be easily had as to the amount paid out for mobilizing the rubber factories, for salaries paid to non-working soldiers and their dependents, for extra buildings for special war work, for the expenses of executives and department heads sent to Washington to aid the Government, nor for the insuring of shipments of raw rubber against enemy destruction, but it totalled a very large sum.

Pays Heavy Toll in War Taxes

The rubber industry has to be credited with the payment of no small part of the great tax burden occasioned by the war. Although complete official figures are yet lacking, a fair conception of the share allotted to the industry may be gleaned from the statement of one of the larger rubber companies. For the year 1918 it reported the payment of Government taxes of all sorts amounting to the sum of $19,289,534.86 as compared with its capital of $100,000,000. One estimate gives the average amount paid by rubber manufacturers as 3 per cent on their total output. As the United States census reports give the total production of rubber goods for the year 1919 as $1,145,790,000, the income charges on that amount at 3 per cent would total $34,373,700. The real amount is probably much higher, and necessarily it implies a huge loss of capital in super taxes.

Difficulty in Disposing of Surplus

Through the extensive dislocation of trade as a result of the war, rather than through lack of enterprise on the part of American manufacturers, the efforts of producers of rubber goods in the United States to dispose of their surplus production abroad have been attended with much difficulty, even since the Armistice. In 1914 when, in round numbers, American production of rubber goods totalled $300,000,000, exports reached some $13,000,000, or about 4⅓ per cent. In 1919 the total output was $1,145,780,000 but the exports remained in practically the same proportion, $53,865,655, or 4 7/10 per cent. The distribution of imports and exports is shown in these tables, which cover also the year 1920, in the middle of which the industry reached peak production, but for which official totals have not yet been compiled:

United States Imports of Manufactured Rubber Goods from Countries Producing Manufactured Rubber Goods—1914 and 1920

	Fiscal Year Ended June 30,1914	Calendar Year Ended Dec. 31, 1920	Increase+ Decrease—
United States (total)			
From Great Britain	314,969	928,767	603,798+
Germany	669,491	27,690	641,801—
Spain	140	.....	.....
France	138,308	13,003	125,305—
Canada	36,595	350,579	313,984+
Australia and New Zealand	40	.....	.....
Russia	149,826	.....	.....
Japan	1,335	27,126	25,791+
Austria	46,064	67,013	20,949+
Belgium	153,395	.....	.....
Italy	6,128	.....	.....

United States Exports of Manufactured Rubber Goods to Countries Producing Manufactured Rubber Goods—1914 and 1920

	Fiscal Year Ended June 30, 1914	Calendar Year Ended December 31, 1920	Increase+ Decrease—
United States (total)	$12,441,220	$85,436,897	$62,995,677+
To Great Britain	3,275,785	9,062,255	5,786,470+
Germany	657,583	673,068	15,485+
Spain	13,228	.....	.....
France	180,977	3,542,480	3,361,503+
Canada	2,357,378	7,267,940	4,910,572+
Australia and New Zealand	764,407	4,829,220	4,064,813+
Russia	11,687	.....	.....
Japan	227,257	1,948,474	1,721,217+
Austria	15,162	201,864	186,702+
Belgium	70,558	1,484,279	1,414,721+
Italy	42,719	1,319,891	1,277,172+

A list of the losses sustained by the rubber industry should also include the considerable expense of extra guards employed to safeguard the plants executing war orders; the setting aside for employes of thousands of acres for war gardens to help the Government in its food conservation campaign; and mention might also be made of the loss occasioned by the closing of 1,200 breweries by a war order in 1918. For that industry, with an investment of $2,000,000,000, rubber manufacturers equipped 3,600 trucks with 21,600 solid tires valued at $1,620,000, besides furnishing a great amount of hose, boots, aprons, belting, etc.

Rubber Goods for War Uees

Despite all the burdens, drawbacks, and responsibilities that the rubber industry had to assume in war-time, it played a most important part in bringing victory to the Allies and it can be said that high quality marked the nearly one hundred different articles of rubber produced in great quantities for the American forces on land and sea, and the prices charged the Government were much less than were paid by the largest private buyers.

It is generally conceded that had not good masks in abundant quantity been supplied the American forces in France, the Central Powers would have won the war. The masks were a novelty for American rubber manufacturers, but the latter not only soon made them by the millions, but made them better than the foreign product. For the kite, dirigible, and observation balloons, the American rubber men produced in an incredibly short time a supply of fabrics that equalled in non-permeability to gas the best produced abroad.

Among the articles besides those mentioned provided for war uses by American rubber factories, and many of which proved of vital importance, were pneumatic tires for passenger cars, motorcycles, airplanes, lorries, ambulances, and trucks; solid tires for various heavy vehicles; airplane bomb cushions and gas tank protectors, respirators and helmets for airmen, divers' suits for men on submarines and battleships; hose and tubing for gas attacks, trench pumps, ships, airplanes, vacuum cleaners, oil and gasoline tanks; waterproof covers for guns, wagons, and gun carriages; battleship shock absorbers, matting, carpeting, and step treads for ships, submarine gaskets, packings, battery-jars, etc.; insulated wire and insulating material; ponchos, slickers, raincoats, boots, shoes, arctics, gloves for acid and electrical workers, aprons, camp blankets, ground sheets, belting, horse troughs, buckets, athletic goods, sheeting, water bottles, ice bags, bed pans, and a score of other hospital needs in hard and soft rubber.

Rubber Gains Noted

Reviewing the gains, tangible and intangible, scored by the rubber trade during the war: New machinery and manufacturing methods were developed to save time and labor and yield better products; prices of manufactured goods advanced; new markets in non-European countries were opened for our products and the trade learned how to make a vast number of articles never before manufactured; redoubled interest was taken in methods for simplifying and standardizing work and products; vulcanizing accelerators and compounding ingredients were greatly improved upon; a new impetus was given to the reclaiming of rubber so that industry alone totalled a business in 1918 of $300,000,000; a demand was created for large-size pneumatic and solid tires; a new interest was aroused in "truckportation"; better balloon material was developed not only for military but for commercial uses, and the same may be said of war gas masks being adapted for workers having to cope with factory fumes; important improvements were made in surgical goods, notably in the use of tubing for the Carrel-Dakin wound-irrigating treatment and in rubber tissue which proved much superior to gauze for dressing injuries.

Threatened with, and afterward experiencing, a scarcity of rubber, interest was actively revived in projects for planting rubber shrubs in the United States, and some promising researches have been made in that direction.

A big shortage in cotton impelled rubber manufacturers to establish huge plantations in the Southwest, the crops not only benefiting the owners but also easing the market for all cotton users as well. Now southwestern long-staple cotton has largely taken the place of Sea Island and Egyptian cotton.

During the war as shipping grew scarce and cargo space became valuable better methods of baling rubber were worked out and fully 25 per cent gained in space.

Burying a Rubber Bogy

Incidentally one of the great bogies of the trade was laid at rest—that of synthetic rubber. The old bugbear ceased to trouble nervous rubber men when it was shown that the best the most skilful German chemists could do was to produce a small quantity of a substance which, mixed with natural and reclaimed rubber, made a very unsatisfactory substitute for the real article.

Another revelation the war brought was the amazing extent to which rubber manufacturers in Central Europe counterfeited trade-marks, infringed on patents, subsidized shipping, sold some goods below cost, and adopted various unfair ruses to gain control of markets. Indeed, the rubber industry gained a new

and valuable knowledge of world trade, geography, foreign credits, marketing methods, and commercial interdependence.

Gains to be noted would also include a better appreciation of the man worker who has passed his 35th birthday, and whose judgment, balance, and reliability are quite as important as the physical alertness of his junior coworker. So, too, is a better value placed on the services of women in the lighter operations in rubber factories.

The rigorous test of war also reassured tire makers that they need fear no competition from tire-fillers or spring wheels as substitutes for pneumatics, for both proved wholly useless.

A salutary showing was the expansion of the capital of many large rubber companies to provide for rapid extension of their business. This expansion is well illustrated by the figures reported for four concerns, during the war period, as follows:

	1914	1918
Goodrich, B. F. Co., The	$19,037,977	$43,024,619
Goodyear Tire & Rubber Co., The	10,724,323	55,655,663
Kelly-Springfield Tire Co.	2,435,491	8,382,681
United States Rubber Co.	41,423,828	101,552,038*

*Increased in 1919 to $300,000,000.

Direct Shipments of Crude Rubber

One of the results of the World War, which may be also noted as a gain for the American rubber industry, was a shifting about of the sources of crude rubber supply, and the abolition to a considerable extent of the delays and costs of dealing with European middlemen. Of the entire crude rubber consumption by the United States in the fiscal year 1913-14, valued at $75,162,220, only 16,597,105 pounds, valued at $9,675,709, came directly from Asia. In 1920, however, the direct shipments of crude rubber to the United States totalled 429,021,505 pounds, valued at $133,168,879.

Great War Lesson

The great lesson of the war, and an experience which may be turned to much account in peace, was the allocation of crude rubber in the United States. Mention has been made of the manner in which American manufacturers got relief from the embargo put on rubber by the British Government in 1914, by having The Rubber Association of America buy crude rubber through London and distribute it in the United States under certain restrictions that prevented any from passing into enemy hands. When the United States Government, as a war measure, assumed control of crude rubber imports May 1, 1918, The Rubber Association, which had functioned so efficiently under the British arrangement, was prevailed upon to continue its work, which it did until the Government relinquished control January 20, 1919. During the ten months the Government allowed the importation of 74,166 tons on new contracts. Old contracts brought the total amount imported for the period up to 96,432 tons, all of which was impartially prorated among manufacturers according to the War Trade Board regulations. The experiment of allocation was one of the most unique as well as one of the most successful in commercial history, and although conceived to meet the exigencies of war-time, the impression is gaining ground that such a system of controlling the distribution of a great commodity might do much to stabilize industry in peace-time. In fact, many believe that similar control might be exercised over all the key industries, that these in turn may act in concert nationally and even internationally; and thus it may come to pass that the great leaders of industry may be able to do what great banking interests, powerful church influences, fraternal and other associations proved unable to do—avert war, by making it practically impossible for bellicose nations to get the materials with which to wage war.

At any rate, leaders in the rubber industry hope that their experience in war-time allocation may suggest to the advocates of peace-preparedness a basis on which industries generally may cooperate to avert a recurrence of the 1914-1918 world catastrophe.

Poncet Davis Co., Cotton Manufacturers' Representative

Poncet Davis, for the past five years assistant manager of the cotton fabric department of The Goodyear Tire & Rubber Co., has organized the firm of Poncet Davis Co., Akron, Ohio, and as a manufacturers' representative will handle yarns, drills, tapes, hollands, osnaburgs, sheetings, and tire fabrics for the rubber trade. Principal offices have been opened at 218 Central Savings & Trust Building, Akron, Ohio, with a branch office at 350 Broadway, New York, N. Y.

Poncet Davis

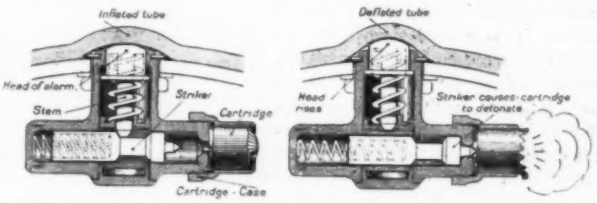
A graduate in textile engineering of a Southern Engineering College, Mr. Davis has had extensive experience in raw cotton, cotton goods manufacture, and in supplying cotton fabrics to the rubber trade. His intimate knowledge of the requirements of the cotton and rubber industries, his wide acquaintance and pleasing personality proclaim his ability to serve both the manufacturer and consumer of cotton goods.

B. M. McDuffie, also a former Goodyear textile man, first at Akron, and for the past eighteen months manager of that company's California cotton and fabric department, is now connected with the Akron office of the Poncet Davis Co.

NOVEL TIRE PUNCTURE ALARM

The illustration shows an ingenious patented device which warns the motorist when his tire goes down. It is attached to the wheel rim exactly opposite the inflating valve. When deflation of the tire occurs, a spring actuated striker explodes a blank cartridge, the report of which warns the driver that the tire has been punctured or is in need of reinflation.

The alarm is particularly valuable for vehicles running on twin tires and for trailers. If a rear twin tire punctures, the remaining



Michelin Tire Alarm

sound tire is left to bear all the weight and by continuing to run will be ruined. In the case of the trailer, without the alarm, there is great danger of destroying the tube and cover on any run.

The alarm works in time to prevent sudden deflation and accidents, but it does not give warning in case of gradual underinflation, even though the latter be serious.—Michelin Tire Co., Milltown, New Jersey.

Dr. Weber Marries

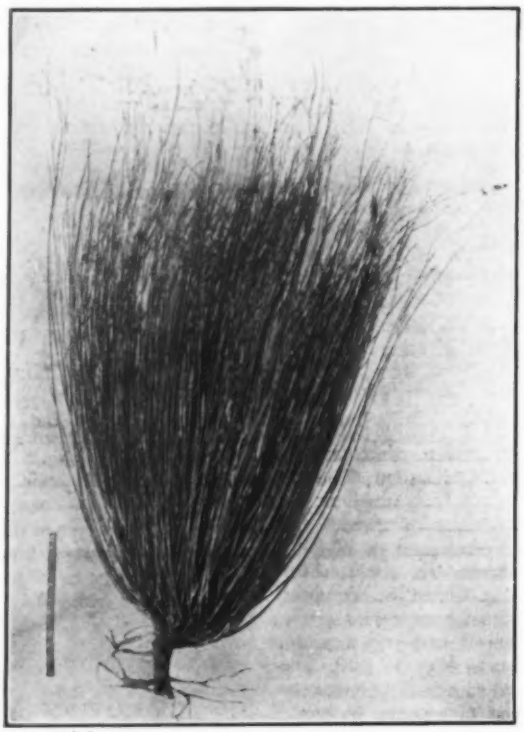
Dr. Lothar Weber, the widely known rubber and industrial chemist, was married November 24, to Miss Sybilla Mittell, daughter of Mr. and Mrs. Philipp Mittell of Yonkers, New York. The bride is an artist of note, a specialist in animal paintings which have been exhibited here and abroad. After a motor tour of the California Coast Mr. and Mrs. Weber will make their home at the Hotel Canterbury, Boston, Massachusetts.

Crude Rubber and Paper Pulp from an Asclepias

Review of the Work of Professors Hall and Long

AMERICANS who hope for home-grown rubber may find much encouragement in the report recently published by the Carnegie Institution of Washington, D. C., entitled, "Rubber-Content of North American Plants." The subject is interestingly discussed in the 65-page illustrated volume by Professors Harvey M. Hall and Frances L. Long, who give the results of researches covering several years and extending over a considerable territory.

The work described in the report is to some extent a continuation of the survey of western North America for rubber-producing plants begun in 1917 as a war emergency measure.[1] While that project concerned itself chiefly with a study of the genus *Chrysothamnus* and related shrubs in which the rubber occurs as solid particles in the cells of the shrubs, as in guayule, the present report deals mostly with the genus *Asclepias* (milkweeds), *Apocynum* (Indian hemp), and similar herbaceous plants in which rubber occurs somewhat as an emulsion in the latex, or milky sap, which in turn occupies the vessels of the highly-specialized lacticiferous tissues.



Hall and Long

Asclepias Subulata Collected at Sentinel, Arizona—Plant Five Feet High

To quote the investigators: "While the prime object of the earlier search was to locate an emergency supply of rubber in native shrubs, the object of the present one is to discover, if possible, some latex plant sufficiently promising to justify experiments looking towards its cultivation as a rubber-producing crop. A second object is to extend the knowledge of the occurrence of rubber in plants, quite irrespective of any immediate practical results. During both these investigations attention has also been given to many plants other than those of the two genera named so that definite information is now available as to the presence or absence of rubber in about 225 species and varieties of western American plants."

Out of such an array of plants the botanists found about 6 species of shrubs and 16 species of latex-bearing herbs worthy of further study and experiment. Nothing is known concerning the rubber content of about 80 native species of *Asclepias*—other than those examined, all of which presumably contain at least a small amount of rubber.

The investigators are convinced that if natural rubber is ever produced in the United States in commercial quantities it will have to be from a plant which will give large yields on cheap land, which can be handled almost entirely with machinery, and which will yield good paper pulp or other by-products of value. Of all the plants considered, the one that comes nearest to meeting those requirements is *Asclepias subulata* (desert milkweed).

The rubber content of *A. subulata* averages as high as any of the other plants examined, and the latex value is sufficiently fluctuating to indicate that superior high-yielding strains could be produced through breeding and selection, an indispensable condition for the utilization of any native plant. It has been proved to be a producer of very fine paper pulp. Like the other *Asclepias* examined, and the species of *Apocynum* investigated, *A. subulata* is a perennial, growing rapidly on poor soil from seed or portions of the root. It is possible that several crops could be harvested with machinery in a year and without replanting. The plant is a rounded herb, woody at the base in some types, 3 to 8 feet high, 2 to 6 or even 10 feet broad when growing in low places where water accumulates after rains, narrow and few-stemmed when on dry, upland slopes; roots deep, ending above in a much-branched crown; stems usually 12 to 30 in poor plants, but up to 500 or more in robust forms; and having dull greenish-white flowers after the rains. Preeminently a desert species, it ranges from southeastern California, western Arizona, and western Sonora, Mexico, across Lower California to the islands off the west coast.

Considered by the investigators as one species of *Asclepias* of outstanding promise, *A. subulata*, a nearly leafless plant, contains from 2 to 6.4 per cent of rubber in its stems. Other latex plants examined carried more rubber in their leaves than in their stems. Determination of the pure gum content was made by the acetone-benzene method to eliminate resins or other admixtures. The percentage is based upon the dry weight of the material analyzed.

The rubber in the plants examined appears to vary with the species, with small races, or strains within each species, and also with environment during growth. High percentages are often associated with vigor of growth, and with mature rather than immature plants.

Plants besides *A. subulata* considered of special interest and the rubber percentage of their mature leaves are:

	Rubber Per cent		Rubber Per cent
Asclepias sullivanti	1.2 to 8.1	*Asclepias galioides*	0.6 to 5.2
Asclepias syriaca	1.1 to 4.4	*Asclepias brachystephana*	2.1 to 2.9
Asclepias californica	2.6 to 4.3	*Asclepias speciosa*	1 to 3
Asclepias latifolia	2 to 3.8	*Apocynum cannabinum*	0.7 to 5.1
Asclepias mexicana	1.4 to 4.8		

It is made clear by the investigators that the product has been examined for only a few species and that these examinations have not been as thorough as desired. They indicate, however, that the rubber is probably of low grade and not to be compared with upriver fine Pará, with plantation rubber, nor with chrysil—the product of *Chrysothamnus nauseosus*. It is suggested that it might be found useful for mixing with other rubbers and in manufactures where great elasticity is not required.

As there is a marked variability in the wild plants and in the number of species involved, it is reasonably assumed that strains with a higher rubber content than any thus far discovered could

[1] See "Three Hundred Million Pounds of Chrysil Rubber," THE INDIA RUBBER WORLD, January 1, 1920, page 203.

be developed by using pedigreed seed or by vegetative reproduction, and that even the quality of the rubber could be much improved by such methods.

Incidentally the authors of the report dispose of the claims made for ocotillo, for various species of cactus, as well as ocean kelps, as rubber yielders by stating that most exacting tests have shown the same result with all of them,—that rubber was very conspicuous by its absence.

Opinion is withheld regarding the financial results that might follow an attempt to grow the plants on a commercial scale. "It is certain, however," says the report, "that considerable scientific experiment should precede any such attempt. Sufficient data have been accumulated to justify the recommendation that these experiments be now undertaken. In this connection there should be considered those native shrubs in which the rubber occurs as solid particles and also various exotic shrubs and herbs, as well as the native species of *Asclepias* and *Apocynum*."

It is regrettable that space does not permit more extended quotation from this admirable review of home-grown rubber possibilities, or to reprint the complete list of plants studied or the tables giving analyses of the plants, seasonal variation of rubber content, the results of numerous experiments in extraction of rubber and by-products, the ecological and histological features of the plants, etc. Suffice it to say, that the report is a welcome and valuable addition to the none too extensive literature on the engrossing subject of extratropical cultivation of rubber plants for a great industry.

ONE REASON WHY TIRES WEAR OUT

By W. F. Schaphorst

There would be absolutely no wear on an automobile tire if the tire ran on a perfectly smooth road. Any road, to be of value, must exert a frictional force on the tire. No automobile could run on a frictionless or "perfectly smooth" road. In order to have tractive force there must be friction, and friction means wear.

These facts being true, it is evident that there will always be wear on a tire, no matter how smooth the roads may be made. The smoother, of course, the less the wear, but no matter how much friction exists between the tire and the road there is always some unavoidable slip or more properly "creep."

To illustrate that creep exists and that it isn't slip attach a weight at the end of a rubber band and another slightly lighter weight at the other end. Support the weighted band over an ordinary spool, running a lead pencil through the spool. Now rotate the spool slowly one way or the other and the weights will move up or down. Continue the rotation back and forth and it will soon be noticed that a given point on the band doesn't always come back to the same point on the spool as would be the case if the weights were equal. One weight being heavier causes the rubber band to gradually move in its direction. This movement is called "creep."

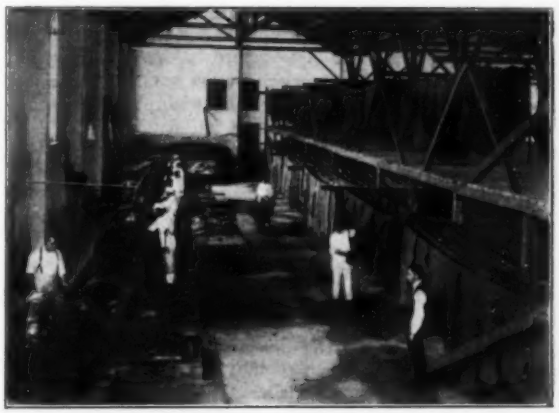
The same is true in the case of an automobile tire. There is a gradual "creep" in the direction of motion of the tires. This holds true for the rear tires only. Front tires do not creep because they do not transmit power.

Creep has the same effect as slip in causing wear on the tires but it is so small that it is impossible to detect it with the naked eye; nevertheless it exists. In going a mile, for example, the rear tires may rotate 606 times, whereas the front tires of the same diameter will rotate only 600 times. There are therefore six extra rotations of the rear tires due entirely to creep. These rotations are absolutely lost as far as distance and power are concerned and, besides, they produce much of the excess wear of rear tires.

Horsepower loss is directly proportional to the creep. Thus a rear wheel that makes 100 revolutions would make only 99 if "pushed" along as are the front tires and therefore the power loss due to creep is one per cent. This explains why the rear tires are the ones that suffer most wear. One of the big reasons is "creep," as well as slip and heavier loads.

Washed and Dried Rubber from Pará[1]

The phenomenal development of the plantation rubber industry during the past 20 years has placed even the best wild Pará grades from South America at a serious disadvantage in point of competition. Whereas, in 1900 the Amazon supplied about 50 per cent of the world's needs of rubber, today it supplies only about 7 per cent or about 18,000 tons. An effort is now being made in Brazil to meet the competitive prices of plantation grades



Washing and Drying Rubber in Pará, Brazil

by washing and drying in Pará upriver fine, caucho ball and up river coarse grades.

This enterprise has been organized by Francisco Chamié, well-known Brazilian exporter of crude rubber to the United States and Canada. The company is known as The Rubber Refining & Manufacturing Co., Inc. It was incorporated under New York laws, March 11, 1921, with a number of American crude rubber men as officers. The factory was incorporated in Pará, August 26, 1921, and has a capacity of 300 tons of washed and dried rubber a month.

Special grants have been made to the company by the State and the City of Pará and it will also be entitled to receive a compensation from the Brazilian Government because it is the first company to establish this line of business. The plant has been in operation about two months and shipments of rubber from it have already arrived in New York in fine condition. Upriver fine grades are sent in crêpe form; caucho ball and upriver coarse and the lower grades in block form. In order to insure absolutely reliable quality of the grades, the Brazilian Federal and State Governments maintain inspectors at the factory. The principal interest of the Brazilian Government is to check the quality for collection of the proper duty which is paid ad valorem and is collectable at different prices according to grades.

The company has several important advantages in connection with its trade in washed and dried rubber. The crude rubber received direct from the docks at Pará is washed with electrically driven modern mills and air-dried at normal temperatures. The Brazilian labor employed naturally receives lower rates of compensation than American or European labor for the same work. There is a marked economy on the delivered price to manufac-

[1]The information and illustration used in this article were supplied by Charles E. Wood, crude rubber broker, 287 Broadway, New York, N. Y.

turers owing to the elimination of freight charges by the removal of 15 to 25 per cent of water and impurities that accompany unwashed crude rubbers. The final result to the rubber manufacturer will be the assurance of specified standard washed and dried Pará grades at prices competitive with plantation sorts, and the entire elimination of the need of operating his own rubber washing department.

In addition to preparing washed and dried rubber, The Rubber Refining & Manufacturing Co., Inc., also plans to produce tennis shoes and rubber articles to be sold in South America. It is not its intention, however, to export any of this material to the United States.

THE BRAZILIAN CENTENNIAL

A generous response is being made by various industries to the appeal of the United States Committee for the Brazilian Centennial Memorial which is to be presented by this country to Brazil on the occasion of the latter's celebration next September of the one-hundredth anniversary of its independence. The committee, composed of Americans prominent in international affairs, is cooperating with the American Chamber of Commerce for Brazil, in Rio de Janeiro, which fathered the memorial project originated by the American colony in Brazil.

The token of the traditional friendship and future good will between the United States and Brazil will be a substantial one—a colossal figure in bronze by the noted sculptor, Charles Keck, of New York, typifying friendship, "Amicitia," the right hand holding a sprig of laurel, while the left supports the flags of the United States and Brazil bound together with palm and laurel. The main figure is supported on a tall, columnar pedestal of stone, decorated with appropriate bas-relief ornaments; and, posed against it near the base are four standing figures: George Washington and Abraham Lincoln, representing the United States, and José Bonifacio and Rio Branco, representing Brazil. Beneath these figures are three bas-reliefs, one depicting the signing of the American Declaration of Independence, another Emperor Dom Pedro at Ypiranga River declaring Brazil independent of Portugal, and the third a scene symbolizing the lasting friendship of the United States and Brazil. On the base is the inscription that the memorial is the gift of the people of the United States to its sister republic.

American Memorial to Celebrate Brazilian Centennial

John L. Merrill, president of All-America Cables, Inc., is chairman of the United States Committee; C. A. Richards, vice-chairman; John H. Allen, president of American Foreign Banking Corporation, treasurer; and Leslie E. Freeman, secretary, with offices at 2 Rector street, New York City.

The other members of the committee are as follows: Lawrence Armour, vice-president Armour & Co.; Newcomb Carlton, president Western Union Telegraph Co.; James Carson, president Pan American Advertising Association; Charles Lyon Chandler, foreign manager Corn Exchange National Bank of Philadelphia; J. T. Cosby, vice-president National City Bank of New York; D. E. Delgado, export manager Eastman Kodak Co.; Henry J. Fuller, vice-president Fairbanks-Morse Co.; M. R. Gano, president Gano Moore Co.; Elbert H. Gary, chairman of board United States Steel Corporation; Peter H. Goldsmith, director Inter-American Division, American Association for International Conciliation; Franklin Johnston, publisher *American Exporter*; Julius G. Lay, of Speyer & Co.; W. S. Gravan, vice-president E. I. du Pont de Nemours & Co.; H. C. Lewis, general manager National Paper & Type Co.; John Bassett Moore, president The Pan American Society of the United States, Inc.; Charles M. Muchnic, vice-president American Locomotive Sales Corporation; Frank C. Munson, president Munson Steamship Line; T. S. B. Nielsen, of Sorenson & Nielsen; Charles H. Pratt, president Pratt & Brake Corporation; Kermit Roosevelt, vice-president Kerr Steamship Co.; Jordan Herbert Stabler, vice-president All America Cables, Inc.; W. R. Strickland, vice-president Strong & Trowbridge Co.; A. H. Titus, president First Federal Foreign Banking Association; D. G. Wing, president First National Bank of Boston; Charles A. Stone, president American International Corporation; Lewis E. Pierson, chairman of board Irving National Bank; and Samuel Vauclain, president Baldwin Locomotive Works.

PNEUMATIC TRUCK TIRES LIMITED

The consensus of opinion among manufacturers of trucks and tires appears to be that pneumatic tire equipment cannot be recommended for motor trucks over 3½ tons capacity. One manufacturer states that, while experiments have been made with 9 and 10-inch sizes for 3 and 3½-ton trucks respectively, the 8-inch tire for a 2-ton truck has proved to be the largest size for satisfactory service. Six-wheel trucks, using 8-inch tires, and built with a 5-ton capacity, may possibly be developed, although such deterrents would have to be considered as the carelessness of drivers, and the fact that few repair shops carry proper equipment for repairing large truck tires, while the whole question must also be kept in mind of the possible injury to the roads.

It is estimated that about half of all trucks made in 1920 were pneumatically equipped, and of these trucks 6 out of every 10 were of 2½ tons or less capacity, using so-called passenger tire sizes, that is, 35 by 5 or under. The fact that road conservation is wisely being stressed may be a factor in hindering the development of heavy construction along these lines, even when the trucks referred to may be equipped with pneumatic tires.

MOTOR INDUSTRY SHOWS FAVORABLE CONDITIONS

That improvement in the automotive industry will be gradual is indicated by the comparative figures following, prepared by the Motor and Accessory Manufacturers' Association. During October the sale of parts and equipment by about 300 representative manufacturers, to the principal car and truck makers, fell 5 per cent, while the total amount of notes outstanding dropped a little less than 6 per cent.

COMPARATIVE FIGURES FOR 1921

Month	Per Cent Change*	Per Cent Change**	Per Cent Change***
February	66.15†	17.07‡	39.08†
March	93.30†	16.57‡	16.38‡
April	32.93†	4.49‡	5.94†
May	00.13†	15.64‡	16.77‡
June	15.19‡	4.79†	10.37‡
July	1.68†	10.79†	7.90‡
August	1.31†	17.06‡	5.30‡
September	1.09‡	00.22†	5.24†
October	4.70‡	3.54†	5.82‡

*Purchases of parts, units, equipment, etc., by automobile passenger car and motor truck makers from 300 parts and accessory manufacturers by months—per cent change.
**Totals of past due accounts reported, per cent change.
***Totals of notes outstanding, per cent change.
†Increase. ‡Decrease.

A Glossary of Words and Terms Used in the Rubber Industry—XI[1]

By Henry C. Pearson

Pneumatic Tire Definitions[2]

TALC (FRENCH). Acid magnesium metasilicate used in powder form to prevent tubes and casings sticking together; for dusting molds and inner surfaces of tubes in repair; and in paste with water to fill designs on semi-cured tread stock to keep them from flattening under heat and pressure in retreading.

TANDEM TIRE. A large tire used on tandem motorcycles, usually 29 by 2¾ inches.

TAPE MARKING. Reproduction on sidewall and casing of the weave of the cloth in which the tire was confined during vulcanization.

TAPE (TIRE). A narrow adhesive strip of cotton sheeting frictioned with rubber and used for emergency tire repair. Also an uncoated cotton fabric in wide strips used for wrapping a built-up casing during open cure.

TENSILE STRENGTH. Resistance to extension shown in testing tire-building materials.

TESTING. Subjecting materials to severe examination to determine quality, condition, strength, pliability, resilience, suitability in combination, and general serviceability; for which scientific devices and standards have been provided.

Fabric Tests.

Mechanical or Physical Tests. Application of force to ascertain and measure physical condition and properties; employment of apparatus in judging material qualities or in estimating deficiencies. Such tests are made of uncoated tire fabric to determine the following:

Contraction of filling	Strength
Crimp	Take-up
Elasticity	Texture
Elongation	Thickness (Gage)
Folding endurance	Twist
Length	Weight
Moisture content	Width

Tensile Strength Tests. (Standard United States Government practice.) The tensile strength of tire fabric is obtained by cutting strips 6 inches long by 1¼ inches wide from the sample and unraveling from each side to a width of 1 inch. The jaws of the testing machine must be not more than 1 inch wide and 3 inches apart, separating at the rate of 12 inches a minute. Results obtained by taking the average of three tests each on both warp and filling are accepted as the tensile strength of the fabric. When practicable, tests are made after conditioning the fabric in an atmosphere having a relative humidity of 65 per cent and at a temperature of 70 degrees F. for 2 hours. If this is not practicable, the fabric is tested under existing humidity conditions and results corrected to a 6 per cent moisture basis by applying the following factor:

100 ÷ 100 plus 7 (per cent moisture — 6), the factor being less than unity when the per cent moisture is greater than 6, and vice versa.

Moisture is determined by weighing six samples together before testing, and tensile strength is immediately obtained in rapid succession. The broken samples (entire) after rupture are placed in a ventilating drying oven at 105 degrees to 110 degrees C. (221 to 230 F.) until weight is constant. Moisture is calculated on the basis of the above dry sample.

All fabric weights are given in ounces per square yard, and calculated on a 6 per cent moisture basis. Tolerance 3 per cent plus or minus.

For cord fabric, tensile strength is calculated on ten individual cords taken from each cord fabric sample. Results must be up to the standard specifications of individual manufacturers.

Visual Tests. Critical examination for visible imperfections or deviations from a standard. Irregularities in visual tests of tire fabrics include:

Bad start ups	Plus or minus thread count
Beat ups	Pulled in selvage
Broken threads	Reed marks
Drop end yarn	Slack filling
Floats	Slack warp ends
Hard twist yarn	Smashes
Loop knots	Soft twist yarn
Mispicks or double picks	Split end yarn
Mixed warp or filling	Uneven fabric
Oil stains	Warp knots

Coated fabric cut into strips on bias cutters is also tested for calender distortion.

Inner Tube Tests. Inner tubes are tested by manufacturers by first inflating to a high pressure and then immersing in a vat of water to discover leaks in tube, valve, or around valve, which would be revealed by air bubbles. For elongation, Government requirements also include a stretch of not less than 750 per cent (1 to 8½ inches). Valve leakage is also tested and accurately gaged with a water-filled U-tube affixed to a valve.

Tire Tests.

Friction Tests. Determination of the degree of strength of union, or adhesion between plies of fabric or fabric and rubber in a casing. In United States Government practice the test is made on a one-inch strip, measured circumferentially, cut from a casing utilizing a standard friction or dead-weight machine. The rate of separation shall not be more than one inch per minute when the following weights are used: Between fabric plies 16 pounds, breaker and tread 28 pounds, breaker and cushion 28 pounds, cushion and carcass 16 pounds, sidewall and carcass 10 pounds, and for cord casings, between breaker and tread 32 pounds, breaker and cushion 32 pounds, sidewall and plies 14 pounds, cushion and plies 16 pounds.

Mechanical Tests. Tires tested with resiliometers to determine capacity for allaying vibration and absorbing rebound in striking small obstacles. Tests for loss of power due to inadequate tire equipment conducted with special dynamometer which records the amount of power needed to move a tire and keep it in motion.

Pressure Test. A manufacturing test, in which casings are required to withstand a water pressure, or internal stress, of 300 pounds per square inch for fabric tires, and 330 pounds per square inch for cord tires.

Road Tests. (1) Tabulated results derived from actual use in driving or hauling over various kinds of roads under various climatic and other conditions. (2) The duplication of road conditions as far as possible by machines and apparatus including rough-surfaced wheels, movable axles driven by separate motors and with a heavy pendulum controlling pressure and affording oscillation,

[1]Continued from THE INDIA RUBBER WORLD, December 1, 1921, pages 171-173.

flint surfaced belts run beneath loaded wheels; circular cement track, imitation brick roadways, etc.

Side Thrust Test. A test to which airplane tires of from 75/700 to 150/800 millimeters, inclusive, are subjected, according to United States Government specifications. After being mounted on standard rims, inflated to 50 pounds air pressure, and loaded with a deadweight of 2,000 pounds, they must withstand 1,800 pounds, lateral stress against a surface placed at an angle of 20 degrees with the horizontal without pulling off the rim.

Tread Separation Test. A rough test to determine the quality of material used, character of workmanship, and thoroughness of curing, in which the tread is cut to the carcass and an effort made to tear back with the aid of pincers a short strip of the tread.

TIRE. A contraction of attire, to dress or cover, a tire being the attire for a wheel. While originally, and still applied to the metal hoop binding the wooden felloes of a wheel, it has become the usual designation of the rubber covering for a wooden or metal wheel-band. British spelling, tyre. See Pneumatic Tire.

TIRE BAND. An outside repair boot. See Boot.

TIRE BOLTS. Bolts extending through a felloe and rim and designed to fasten a tire to the latter. They are made with a thumb nut on the under side and on the upper side have a molded section—canvas, leather, or rubber-covered—formed with lips at either side so as to overlap the bead toes. Four to six are used, depending upon the size of the wheel. Also called security bolts.

TIRE BUCKLING. In repair, curling, kinking, or distortion of the inside of a casing in sectional work, usually due to excess pressure on the clamps holding a casing in a vulcanizing mold. See Repair.

TIRE BUILDER FABRIC. See Builder Fabric.

TIRE CANVAS. See Builder Fabric.

TIRE CARRIER. A device attachable to a car built to carry one or two spare tires.

TIRE CASE. See Tire Cover.

TIRE CEMENT. See Cements.

TIRE CHAIN ADJUSTER. A device consisting of four springs radiating from a center chain about a hub and attached with hooks to a side chain on the outer side of a wheel.

TIRE CHANGER. A mechanical contrivance for quickly removing or applying a tire to a rim, the operation of the more complete apparatus being unlocking the split rim, contracting the rim so that the tire may be easily lifted off, replacing the tire on the contracted rim, and finally expanding the rim to the locking point to secure the tire.

TIRE COVER. A case or covering, usually of black enameled duck made to fit over and protect a spare tire with its rim and carrier.

TIRE DEFLECTION. The cross-bending or flexure of a tire causing it to deviate from normal shape in test or service.

TIRE DETACHER. A plain curved bar or a tool consisting of a straight handle and an adjustable hook to facilitate the removal of clincher tires.

TIRE DUCK. A square-woven cotton fabric used in building tires. See Builder Fabric.

TIRE FILLERS. See Fillers.

TIRE FUNCTION. Purpose and work of a rubber tire; to cushion the load, to lessen vibration to automotive mechanism, to increase traction, and to protect the road surface.

TIRE GAITER. See Boot.

TIRE-IRON. A tool for prying on or off a "stretchy" bead tire adapted to a clincher rim.

TIRE PAINT. See Paint.

TIRE PLASTER. See Blowout Patch.

TIRE PROTECTORS. See Boots.

TIRE PUMP. A hand-operated apparatus employing a cylinder and piston for forcing air into pneumatic tires; also a power-driven air-compressing machine used for the same purpose.

TIRE PUTTY. See Dough.

TIRE REMOVER. See Tire Detacher.

TIRE SEAT. See Rims.

TIRE SECTION. A term applied to a sample cut in cross-section from a tire casing.

TIRE SERVICE. (1) Actual mileage and comparative freedom from troubles afforded by a tire. (2) Inflation, inspection, demounting, application of tires, alinement of wheels, etc., by a tire dealer gratuitously or at nominal cost.

TIRE SIZES. Usual proportions of casings as indicated by diameter from tread to tread and by distance from bead to tread; as, a 36 by 4 is a tire with a total diameter of 36 inches and 4 inches from bead to tread. See Sizes.

TIRE SLEEVE. See Reliner.

TIRE SPREADER. A single tool or mechanical device for spreading casings for inspection or to facilitate interiorly the application of boots, shoes, reliners, bead sections, reinforcements, etc.

TIRE STUFFING. See Fillers.

TIRE SURGERY. A term applied to the dissection, repair, and rebuilding of tires.

TIRE TAPING. See Tape.

TIRE TESTER. See Gage.

TIRE TOOL. See Tire Detacher.

TIRE TYPES. Varying models or patterns of tires in general use, each of which possesses salient features, and including clincher, quick-detachable, straightside, pneumatic, solid, non-skid, plain tread, fabric, cord, cord fabric, etc.

TIRE WRAPPERS. See Tire Cover.

TOEING-IN. Alining pneumatic-tired wheels so as to neutralize the tendency to spread while in motion thus giving ease in steering. For front wheels an allowance is made of one-quarter inch from perpendicular.

TOLERANCE. The leeway permitted in deviating from specifications; a slight allowable variance of plus or minus from the standard.

TOP SECTION REPAIR. See Retreading.

TOURIST TUBES. A trade term for extra heavy inner tubes designed for severe service.

TRACTION. The necessary adhesion of a tire to a road surface.

TRACTION WAVE. The continuous bulging of a tire in motion directly in front of the point of road contact.

TREAD. The outer band of a casing made of especially strong, tough, resilient rubber to withstand hard road contact, and to protect carcass and inner tube.

TREAD BANDS. Built-up strips of tread gum in plain, ribbed, or non-skid designs used in new or retread work.

TREAD GUM OR STOCK. Rubber stock used for tread repairs, sidewall mending, and under-cover stock; also for making impression pads for preserving tread designs in curing.

TREAD PATCH. Curing in of gum in small cuts or holes in a tread.

TREAD PATTERN PAD. See Impression Pad.

TREAD SECTION. Cutting out a worn or damaged tread to allow insertion of new material.

TROUBLE, TIRE (Constructional, functional). Difficulties that may be experienced with pneumatic tires, especially those of faulty workmanship, defective materials, variable quality in rubber or fabric, or imperfect curing; and including liability to puncture, tendency to tread separation, fabric rupture due to friction between plies or to strains, excess sidewall flexion, leaks in air or inner tube, misalinement due to uneven rim fastenings or ill-set wheels, or other non-obvious tire defects or shortcomings capable of being revealed only in a road test.

TRUCK TIRES. Tires especially built for vehicles transporting heavy articles.

TRUCK TUBES. Inner tubes for pneumatic truck tires built

thicker than the tubes for passenger cars. See Inner Tubes.

TUBE CASE. A dust and oil-proof bag to hold and protect an inner tube.

TUBE COMPOUND. Rubber compound used for making inner tubes. See Inner Tubes.

TUBE GUM OR STOCK. Sheet rubber of medium specific gravity used in repair. See Repair.

TUBE INJURY. Damage in various forms done to an inner tube; tears and gashes caused by contact with tools, breaks at points where tube is folded, rotting due to contact with oil or grease, all usually caused by carrying tube unprotected; insufficient talc, causing tube to stick to casing, or too much talc, causing lumps which harden and rub; pinching between rim and casing often caused in applying tire to rim with valve stem at a sharp angle, running a tire flat, or by improper adjustment of flaps; gradual collapse through seepage of air through leaky valves or minute perforations in tube; weakening due to tube pressing into a torn or bruised section of casing; longitudinal cuts due to underinflation in which the tube is sharply nipped between rim and casing; and punctures and blowouts caused by sharp objects piercing through casing.

TUBE NIPPING OR PINCHING. See Nipping.

TUBE SPLICING. A mode of shortening a long inner tube or inserting a new section in a damaged tube. See Splicing.

TUBULAR FABRIC. Tire building textile woven on a circular loom and in a curved, tube-shaped form.

TWO-CURE PROCESS. See Combination Cure.

TWO-PLY CORD TIRE. The original cord tire made of a double layer of heavy cords. See Cord Tire.

TYRE CASE. A British term for tire cover.

UNDERCOVER. A strip of 1/16-inch gum uniting tread to a breaker strip.

UNDERCURE. Insufficient vulcanization.

UNDERINFLATION. Insufficient distension of a tire tube with air.

UNDERTREAD. Another term for cushion strip. See Cushion.

UNIT-MOLDED CURE. The welding in one operation, through vulcanizing in a mold of a completely built up casing. See Single Cure.

UNIT-WRAPPED CURE. Vulcanizing a tire after being wrapped in strips of cloth to hold its shape.

UNIVERSAL CANVAS PATCH. A heavy rectangular canvas pad covered with frictioned fabric and used for breaks in casings. See Repair.

UNIVERSAL RIM. A rim adapted to either clincher, quick detachable, or straightside tires.

UNLIMITED SERVICE GUARANTEE. Tire adjustment based upon service without advance mileage promise. See Guarantee.

UNREPAIRABLE TIRES. Tires damaged beyond repair.

UNUSUAL TIRES. Tires not of standard size and obtainable only on order.

UNVULCANIZED SHOE LINERS. Reliners used for temporary repair. See Repair.

UNWOVEN FABRIC. A tire-building fabric made of parallel cords held in place by a sheet of adhesive material. See All Warp Tire Fabric.

VACUUM TREADS. A tread surface with protuberances, the centers of which are so recessed as to afford, under pressure, a suction or vacuum grip on the road.

VALVE GAGE. A metal device for indicating air pressure in a tire or an inner tube.

VALVE HOLE. An aperture on the inner circumference of a tire or an inner tube of sufficient size to admit the valve.

VALVE PATCH. An oval-shaped section of rubber, reinforced with one or more plies of fabric, surrounding a valve and holding it in place on tire or inner tube.

VALVES. A metal device with hollow projecting stem attached to tire or inner tube to allow the admission, effect the retention, and permit the discharge of compressed air.

VULCANIST. One skilled in rubber repair; a vulcanizer.

VULCANIZATION. The application of heat to a mixture of rubber and sulphur by which a rubber compound is transformed from a soft inert plastic into a tough resilient material. See Curing.

VULCANIZER. An apparatus for curing tires and inner tubes, as a whole, or in repair: one who vulcanizes, a repair man.

VULCANIZING. See Vulcanization.

VULCANIZING CEMENT. A heavy solution of pure rubber in a solvent for heat-curing. See Cement.

VULCANIZING FLUID. See Acid Cure Cement.

WARRANTY. See Guarantee.

WATER BAG. A heavy, frictioned fabric water-filled bag substituted for a metal core in vulcanizing a built-up casing.

WATER TEST. Immersion in water of an inflated inner tube to determine by air bubbles the location of leaks. See Tests.

WAVE-BREAKING DESIGN. A tread pattern so corrugated as to break or overcome in some degree the tractino-wave resistance to a tire.

WEAK FABRIC. Fabric rotted by moisture.

WEFTLESS FABRIC. A term sometimes applied to all-warp or cord fabric.

WIDE PULLED FABRIC. Fabric of full-width plies stripped from used or condemned tires.

WIRE BEAD TIRES. An early development of the bicycle tire affording an inextensible edge and later modified for the modern automobile casing. See Straightside Bead.

WIRED-ON TIRE. A tire having a retaining wire in the bead; also referred to as a "Dunlop bead" after the British Dunlop Company which introduced it. See Clincher Tire.

WOOD RIM CEMENT. A cycle cement, heavy bodied, elastic adhesive, for fastening tires to wooden rims.

WORN TREAD. A tread injury due to natural wear, wheel misalinement, quick brake setting, chain abuse, etc.

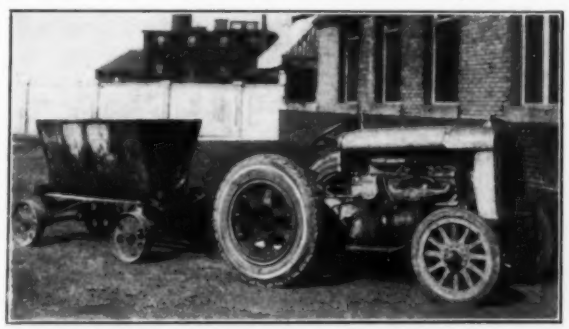
WRAPPED PROCESS. The method of curing a built-up casing by wrapping it in several layers of canvas; in repair, applied to binding a tire to an inside curing mold with cloth strips.

WRAPPED TREAD. See Wrapped Cure.

WRAPPED TREAD TIRE. A tire vulcanized in a toe-mold, a device consisting of a pair of side flanges which reach from the base of the bead to the edges of the tread on either side of the tire, the built-up casing being then cross-wrapped with canvas, the latter in contact with the tread. Under such compression the casing is put into a heater and cured.

GIANT PNEUMATIC TIRES FOR TRACTORS

Certain companies are equipping their Fordson tractors with giant pneumatic tires, manufactured by the United States Rubber Co., as pneumatic tires give better traction than solid ones, it is claimed, especially on wet roads.



Fordson Tractor Equipped with Pneumatic Tires

The tractor illustrated is being used at the Morgan & Wright factory, Detroit, Michigan, for pulling wagons, drawing the sprinkling cart and doing other handy jobs.

The Editor's Book Table

"RUBBER AND OTHER TROPICAL PRODUCTS." OFFICIAL HANDbook and catalog of the Fifth International Exhibition of Rubber and Other Tropical Products and Allied Industries, Royal Agricultural Hall, London, June 3 to 17, 1921. Edited by Edith A. Browne, F.R.G.S. Published by the International Rubber and Allied Trades Exhibition, Limited, 43 Essex street, Strand, London. Paper, 392 pages, 5½ by 8½ inches, illustrated.

Having proved very serviceable as a guide at the largest of the exhibitions showing the development of rubber and other large industries deriving their raw material from the tropics, the handbook now becomes a souvenir worthy of a place in any library. The volume contains a list of the officials of the exhibition, the executive bodies, and the advisory committee, composed of leaders in the rubber and other trades in all parts of the world; an admirable description of the exhibits; an informing prolog on "The Rubber Industry," by Dr. Joseph Torrey; sketches of famous rubber, cotton, chemical, cocoa, coffee, and vegetable oil concerns, besides excellent articles on fibers by Alfred Wiggleworth; fermentation of cacao, by Arthur W. Knapp, B. Sc., F. I. C.; cocoa, by H. Hamel Smith; coffee, by J. Morse; edible oils, by B. P. Flockton, M. I., M. E.; rubber growing in the Belgian Congo, by A. Gisselaire; and cotton growing in the Belgian Congo, by L. Pynaert; cultivating rubber and oil palms in the Netherlands East Indies; as well as about settlers' opportunities in Brazil, Colombia, African West Coast, Mozambique, in the Portuguese possessions and other promising places in the tropics.

"CHEMICAL ENGINEERING CATALOG," 1921. SIXTH ANNUAL Edition, illustrated. The Chemical Catalog Co., Inc., New York, N. Y., 1,294 pages, 9 by 11½.

This well-known annual is an indispensable classified directory covering in standardized, condensed form equipment, machinery, laboratory supplies, heavy and fine chemicals, and raw materials used in the industries employing chemical processes of manufacture. The work also includes a technical and scientific book section cataloging and briefly describing a practically complete list of books in English on chemical and related subjects.

"TIME STUDY AND JOB ANALYSIS," BY WILLIAM O. LICHTER. The Ronald Press Co., New York, N. Y. Cloth, illustrated, 397 pages, 6 by 8½ inches.

This is a text-book by an experienced management engineer on the application of efficiency as applied to factory production. In his preface the author states: "The aim of this book is to explain the practical application of time study and job analysis in simple, non-technical terms." This aim has been accomplished very thoroughly and a student of the subject can scarcely find a more comprehensive treatment of fundamentals and their application to modern systematic factory production. The text is well-supplied with diagrams and charts clearly illustrating job analysis and standardization. The book is provided with an excellent index.

"DEPRECIATION—ITS TREATMENT IN PRODUCTION." ISSUED by the Fabricated Department, E. W. McCullough, manager, of the United States Chamber of Commerce, Washington, D. C. Pamphlet, 24 pages, 6 by 9 inches.

Another excellent publication, and quite as practical and as readily comprehended as the previous works on "A Cost System —What It Should Do for You," "Overhead Expenses—How to Distribute Them in Good and Bad Times," etc. In compiling the pamphlet, it is stated that the department had the cooperation of many leading accountants, industrial engineers, manufacturers, and others. A busy executive may from the following topic summary get a fair idea of the value of the work: The need of charging depreciation into everyday cost, the relation of insurance and depreciation, adjusting depreciation to production, the controlling effect of obsolescence, the advantage of standard rates of depreciation, and how the property ledger operates.

New Trade Publications

A THIRD ANNUAL NOTEBOOK, ATTRACTIVELY BOUND IN LEATHER, is being sent to the rubber trade by R. T. Vanderbilt Co., 50 East 42nd street, New York, N. Y., manufacturer of rubber compounding materials. It has about fifty pages of useful information, including engineering and chemical data, conversion tables, with other interesting matter in connection with rubber compounding materials. The various suggestions, prepared by well-known chemists, have been arranged and edited by Dr. A. A. Somerville, of the Vanderbilt company.

A RECENT BULLETIN FROM THE GENERAL TIRE & RUBBER CO., striking in appearance and optimistic in its purport, suggests the Akron company's proposed activities for 1922.

Sales records of the company show a gain of 30 per cent for this year over 1920, while 82 per cent of its distributers show increased sales, not only in tires but in dollars, over their 1920 sales—a summary which is most encouraging.

SO MUCH INTEREST HAS BEEN EVINCED IN THE SUBJECT OF grafting Hevea that L. Tas, manager of the Pasir Waringin Estates in Java, has undertaken to write a booklet regarding it. A supplement will be added to the work covering tapping results, when the grafts are ready for tapping. The booklet is published by Kolff & Co., Batavia, Java.

A STERLING CONVERSION TABLE, CORRECT TO 1/10 OF 1 PER CENT, is being issued by the Crude Rubber Brokerage Co., 104 Front street, New York, N. Y. The table will prove a useful one, while the data prepared are of especial significance to importers and exporters.

"WHY STRAIGHT SIDE TYRES ARE BETTER" IS THE TITLE OF A 20-page illustrated booklet issued by The Rubber Association of America, Inc., for the benefit of the export trade and foreign tire users. The construction of clincher and straightside tires is contrasted, the disadvantages of the former are pointed out, and the superiority of the latter is fully explained.

In order to utilize the straightside tires it became necessary to develop two rims, one the detachable flange rim, the other the detachable split rim. These were needed because of the non-stretchable steel cables in the tire beads. The use of these rims insures the well-known advantages of straightside tires over the clincher type which briefly are: (1) ease of application and removal, (2) greater security, (3) longer mileage and better service. These advantages are fully explained in the text. The booklet closes with a clearly illustrated series of directions for the removal and application of straightside tires to both forms of detachable rims.

THE NEW JERSEY DEPARTMENT OF CONSERVATION AND DEVELOPment, State House, Trenton, New Jersey, has recently issued an interesting booklet, which sets forth the industrial advantages and opportunities offered by that state. "On a basis of land area New Jersey ranks first in railroad mileage and in total value of agricultural products. On a similar basis it stands third in population, total value of manufactured and mineral products, improved highway mileage and in wealth, and fourth in public schools and electric road mileage. This state ranks first in total value of manufactured products in eight articles, second in twelve, third in thirteen, and fourth in fifteen."

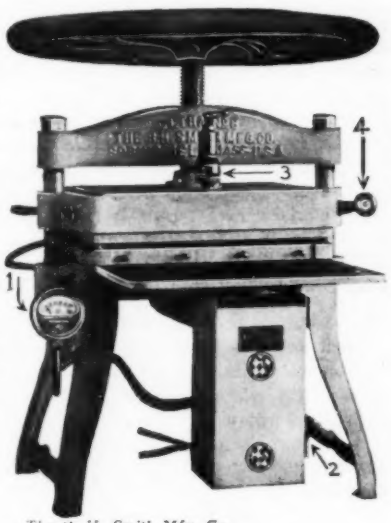
Comparing the value of rubber products with other states, New Jersey comes first in its production of rubber belting and hose, and second in other rubber goods not otherwise specified. In the state itself, as compared with other local industries, and in money value, rubber goods not otherwise specified rank twelfth, while rubber belting and hose occupy the thirty-third place. The booklet aims to encourage the still further development of the state's very important industries.

The Manufacture of Rubber Type

Rubber Types Are Indispensable in Wall Paper, Corrugated Container, and Canning Industries

THE manufacture of rubber type is an important specialty of the rubber stamp trade. It is similar to that of hand stamps[1] with certain important differences of detail, depending upon whether used for hand stamping or printing by power presses and special machine markers.

The features of cheapness and convenience combine to make rubber type printing outfits popular, both for home use and for the merchant and others who desire to mark labels, tickets and samples of various sorts with dates, prices, sizes, color, etc., without the necessity of multiplying excessively the number of hand stamps necessary.



The R. H. Smith Mfg. Co.
"Ultra" Electric Vulcanizer

A considerable export trade to South American and other foreign countries has been built up by American rubber type and stamp manufacturers, who furnish type faces in great variety of style and size.

Making Solid Rubber Type

An impression is taken from a font of metal type in a plastic medium that may subsequently be hardened and used as a mold in which to vulcanize a rubber reproduction.

Matrix Composition

The matrix composition is a quick, hard-setting mixture consisting of 8 parts of plaster of Paris, 8 parts of China clay, 3 parts of talc or French chalk, and enough Indian-red iron oxide to give a pink tint. This color insures greater ease in detecting imperfections in the matrix than would white. The dry ingredients are brought to the consistency of soft putty by mixing with a hot water solution of dextrine in the proportion of 3 to 4 ounces of dextrine to one gallon of water. The dextrine regulates the rapidity with which the plastic composition sets into a hard matrix under the influence of heat.

Making the Matrix

The plastic matrix composition is spread on an iron plate and struck off to a uniform thickness determined by a rectangular iron frame which serves to retain the matrix during formation.

Three successive impressions in a hand press are usually necessary to obtain the desired depth and clearness of the type face. During each impression the matrix gradually hardens and the type used is brushed with naphtha to prevent the compound from adhering to the type during impression.

Drying the Mold

The mold is slowly dried by applying a moderate even heat in any convenient way; frequently a gas-heated plate is used. After the mold is absolutely dry, smoothed down by sandpaper and cleaned out, it is ready for vulcanizing purposes.

Molding Solid Type

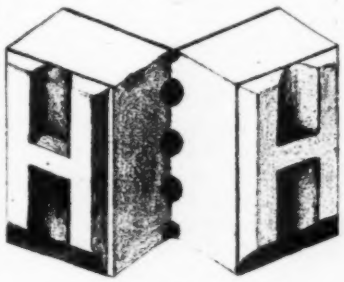
To mold solid type the matrix is surrounded with a rectangular metal frame or chase to regulate the height of the type body. Type are usually made from semi-cured sheets of rubber composition of sufficient thickness, 7/16-inch, to give ample stock and pressure to fill the chase and matrix. In this way shorter time is necessary for the type cure and less waste is produced. Type gum is inferior in grade to stamp rubber and cures in ten minutes at 60 pounds of steam. After cure it is usual to grind the back of the sheet to secure correct type height, as some variation is otherwise inevitable.

Logotypes

Solid rubber logotypes are single word or phrase types of regular height, formed and cured in precisely the same way as single letter types are formed. They are simply a convenience to save typesetting.

Cutting Rubber Type from the Sheet

Rubber type font sheets are cut apart into individual types by an ordinary foot-power or kick-press, such as used for light metal punching. The press is equipped with a suitable bed and cutting block and with a long, straight, and thinly ground knife for doing the cutting. Various gages are employed on the press, according to the needs of the work.



Perforated Cut Type—H

Having cut the type into strips or lines, these are divided into individual types on a smaller cutter usually operated by hand lever for the sake of rapidity. It is desired to leave the line of types united by a perforated connection of rubber at the back for convenience of packing. This result is accomplished by the use, on the bed of the cutter, of a brass plate upon which very shallow parallel grooves are cut and spaced at the intervals at which the perforations are to be made. When the knife descends through the type strip onto this grooved plate the rubber is cut completely through except where it is forced into the grooves by the knife edge and escapes cutting by the depth of the groove.

Metal Bodied Rubber Type

For more workmanlike printing jobs for which rubber-faced type are needed, metal-bodied rubber type are employed. The formation of the matrix for the rubber face is made in the same way as for solid type, taking the impression from a metal type font, after which the faces of the metal font are ground off to sufficient depth and replaced by those of rubber. This is done by surrounding the font matrix with a type-high chase, placing a sheet of stamp gum next the matrix, and upon that placing the cut-down metal font of the type bodies. Rubber and metal

[1] "The Manufacture of Rubber Stamps," THE INDIA RUBBER WORLD, September 1, 1921, page 899.

are then united by vulcanization, after which the individual rubber-faced types are cut apart.

How Rubber Types Are Used

A boxed font of solid rubber type is shown in the accompanying illustration. It is set up for use in a holder accommodating one or more lines. Ordinarily it is held by compression in grooves of a wooden holder or by spring compression holder.

The R. H. Smith Mfg. Co.

Font of Rubber Type and Spring Type Holder

Metal-bodied rubber type have the merits of metal type in accuracy of body and perfect alinement combined with the yielding rubber type face, and consequently are suited to workman-like printing jobs. Such types are set up with the same tools and used on a printing press in exactly the same way as ordinary metal types.

Robert Gair Co.

Rubber Stamp for Printing on Corrugated Containers

Power Printing from Rubber Type

Special rubber stamps and solid rubber type are employed in power printing for industrial purposes in several special lines where no other printing means is available, due to the characteristic ability of rubber to accommodate its impression to an irregular surface, and to other special conditions noted below.

Printing on Corrugated Containers

The printed corrugated paper container for shipment of merchandise is familiar as a substitute for the wooden packing box. The construction of corrugated board is such that the finished material presents a slightly ribbed effect due to the interior corrugated separator. If printed upon by ordinary metal type the necessary pressure would effectually crush the underlying corrugated support and seriously impair the strength of the container. This difficulty is readily overcome by the use of rubber stamps, the elastic quality of which produces a clear impression on the uneven surface without excessive pressure or breaking down the internal corrugated support.

Stamps for this sort of printing are made from wood blocks on which the lettering is cut ¼-inch in depth. Type faces of this depth are essential to secure the requisite elastic quality. The usual plastic matrix is made and the stamp cured from gum 3/16-inch thick in 10 minutes at 80 pounds of steam in a platen press. The stamp is next mounted with glue on a backing of fiber box board with ample margin to permit tacking onto the wooden printing cylinder of a rotary press.

Printing stamps of this sort are made up to 20 by 25 inches. Ordinary printers' ink is used without injurious effect on the rubber provided it is washed off by benzine when not in use. Under these conditions as high as 75,000 impressions may be made from the same rubber stamp.

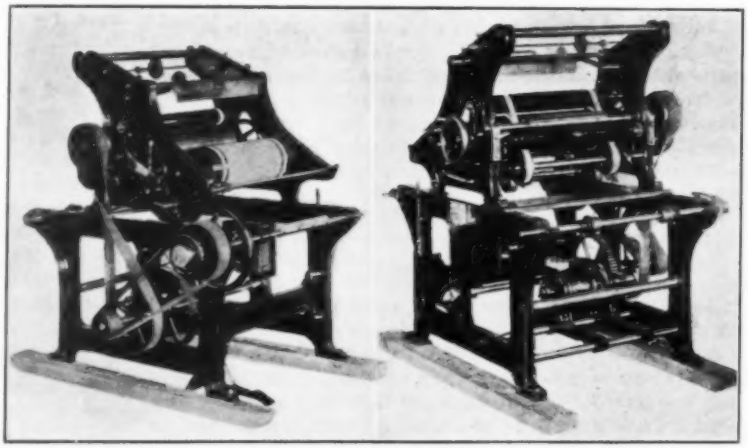
Printing on Wall Papers

Dealers in wall papers cut and make up large numbers of sample books for each season's trade. Every sample sheet in each book bears on the reverse side an imprint specifying particulars, such as style, widths, prices, brand, etc. Printing of this sort can practically be done only by solid rubber type because of cheapness, speed and necessary elastic pressure, particularly on embossed papers. The enormous edition of wall paper sample books calls for special machinery, both in making the books and marking the samples. One of the most successful wall paper markers, here shown, is motor-operated and built to take paper in rolls of any length up to 500 feet, which it will print at the rate of 100 to 150 feet a minute. The impression is made from solid rubber types or logotypes of special form.

Operation of Wall Paper Marker

Front and rear views of a well-known wall paper marker are here shown. A roll of paper to be marked is supported on a center on the front side of the machine. The first end of the paper is pushed downward by a steel blade between a pair of unwinding rolls to start the end through. The roll is guided in unwinding by supporting flanges and is held to the draft rolls at either edge by endless bands. The printing roll, seen in the rear view, is of steel provided with lengthwise dovetailed grooves for holding the rubber type. The rubber type or logotypes are made in steel molds to fit the type grooves accurately and to assure uniform type height. The inking roller, adjustable up to the type roll, is a hollow brass cylinder with perforated walls. It is covered with a felt jacket which absorbs the ink and transfers it to the type with which it runs in contact during the process of printing.

On account of the high speed at which the marker operates a special quick-drying ink is necessary that will not offset onto the face of the paper as it passes through the machine.



Wm. F. Marresford

Front and Rear View of Solid Rubber Type Wall Paper Marker

Marking Canned Food for Identification

Another large and important industrial use for solid rubber type is marking cans for identification in the food canning industry.

The practice of stamping such cans with an identification mark from steel stamps sometimes results in causing a leakage of the can by injury to the metal. This method has been superseded by the entirely safe one of marking by solid rubber type in spe-

Wm. F. Marresford

Solid Rubber Logotype for Wall Paper Marker

cial presses which causes no injury to the can. The employment of special ink produces an identifying mark which withstands obliteration in the subsequent steam sterilization process.

Foreign Tariffs

Austria

According to a decree dated October 20, so-called "luxury" goods imported into Austria will hereafter be subject to customs duties payable in gold. Particulars of the rates applicable to any article or group of articles may be obtained from the Tariff Section of the Department of Overseas Trade, 18, Queen Anne's Gate, London, S.W. 1, England. The inclusion of the following items is of interest to the rubber industry:

Tariff No.	Articles
310	Children's toys of soft rubber.
ex315-17	Clothing and other made-up articles of pure or mixed silk combined with india rubber, and of elastic tissues of pure or mixed silk.
318-19	India rubber wares combined with very fine materials or with mountings of precious metals.
ex320	Tires (inner tubes and outer covers).

Belgium

German goods exported to Belgium become subject to customs duties practically doubled, according to a Belgian decree, effective November 7. Other European countries, in order to secure the benefit of normal rates of duty, must send with their shipments certificates of origin, duly legalized by a Belgian consul in the country of export. The following items were noted as subject to the new rulings: rubber manufactures, a duty of 20 per cent ad valorem; rubber belting, 100 kilograms, 20 per cent ad valorem.

Guatemala

Under the revised schedule of export duties, as recently prepared by the Government of Guatemala, rubber is taxed $0.015 a pound, and chicle $0.07 a pound. On every package exported through Atlantic ports 0.125 pesos is paid for the benefit of the hospital at Chiquimula. The present value of the peso is $0.02 United States currency.

New Zealand

The new customs tariff proposed for New Zealand may not become effective for three or perhaps six months. It is somewhat similar to the revised tariff now provisionally in force in Australia, and consists of three scales of rates. A rubber item of interest is the following: rubber tires, formerly admitted free of duty, will now be subject to a proposed tax of 25 per cent ad valorem.

Portugal

Portuguese regulations of import and export have been amended, and rubber goods are exempt from export surtax. Import duties on certain articles must be paid in gold. Here again exemption from such payments applies to the following: (296-297) india rubber and gutta percha in waterproof or elastic woolen, cotton or linen tissues; (557) wire (except gold, silver or platinum) covered with rubber or gutta percha.

Switzerland

Tariff restrictions, effective November 20th, now govern the importation of certain goods into Switzerland, although such goods may be imported over the Franco-Swiss and Italo-Swiss frontiers without license. Among the items listed and to which the new regulations apply, the following were noted:

Manufactures of rubber included in Tariff Nos. 517, 518, 521, and 522 (except inner tubes and outer covers of tires for automobiles, motor cycles, and cycles); balls, syringes, suckers, air cushions, "poches à glace," and surgeons' gloves (Tariff No. ex 529). Waterproof sheeting for sanitary purposes (Tariff No. ex 528).

Canada

The Canadian tariff amendments, of which mention was made in the December issue of THE INDIA RUBBER WORLD, have been recently revised and detailed regulations covering the requirements for the marking of articles imported into that country have been issued. Items of interest to the rubber trade are the following:

Rubber machinery, when imported unassembled, requires indication of the country of origin on the principal part of each machine or complete equipment, or on the name plate; rubber embossing rolls for wall paper machinery must have a name plate securely affixed or stamped, stenciled, or die sunk on the principal part.

In regard to automobile parts or accessories, brake linings, gaskets, etc., it is sufficient to mark each carton or container. Electrical equipment and supplies, such as mineral rubber and insulated wire, require the marking of each coil, bundle or roll. Plumbers' supplies, such as rubber gas-tube ends, should be marked on each bundle, package, or container, the above regulation holding also for printing supplies, such as rubber type, etc. In the case of office appliances, such as rubber erasers, fountain pens, etc., marking is necessary for each article, while for rubber key tops for typewriters, rubber-knob erasers for pencils, etc., the marking of each separate container only is required.

For druggists' sundries, such as syringes, hard rubber pipes, etc., the marking or labeling of each article is necessary, while rubber stopples require only the marking of each package or container. Stamping or stenciling of each article or the attaching of a woven, sewed-on label is necessary in the case of rubber heels, raincoats, and articles of wearing apparel. Sporting goods, such as golf and tennis balls, require the stamping, stenciling, or permanent marking of each article, as is also necessary for toys, such as rubber balls, etc.

Exceptions are made, however, in the case of raw materials. Crude rubber, for instance, requires no marking to indicate the country of origin, as is also true in regard to partly manufactured materials to be finished in Canada before passing to the consumer. It is believed that the new rulings will be of value to American firms interested in trade with Canada.

EQUALIZILNG EXCHANGE DUTIES

A suggestive article, recently published in *The Annalist*, and written by G. F. Bauer, formerly tariff export, United States Bureau of Foreign and Domestic Commerce, contains some interesting ideas looking toward a solution of the much-discussed tariff question. According to Mr. Bauer no tariff revision whatever is needed now if equalizing exchange duties are employed.

"By these are meant duties that will balance the exchange value of depreciated currencies with their actual buying power in the countries of issue. These equalizing exchange duties would give American industries increased protection where it is mostly if not alone needed now. This evidently is only where competition enters of countries that have a currency of which the value in the United States differs greatly from its value for domestic purchases in the country of issue."

Duties, for instance, on German goods "would be of such an amount to equalize the difference between the value of such goods expressed in dollars at current exchange, and the value of the same goods ascertained in dollars at a rate corresponding to the relative buying power of the mark in Germany." Exchange duties must be equalized if American manufacturers are to be sufficiently protected, and how this may be actually accomplished is shown in the following example of a typical importation of German toys:

Valuation

Value in marks of shipment of German toys	10,000
Value of toys converted into dollars at normal rate of 23.8 cents	$2,380
Value of toys converted into dollars at current rate of .0138 cents	138

Customs Charges

Regular duty of 35 per cent of value determined at current rate, 35 per cent of $138	$48.30
Equalizing exchange duties of 6.5 per cent of value determined at normal rate, 6.5 per cent of $2,380	154.70
Total	$203.00

"The foremost feature desired in any tariff is facility for estimating costs of imports in advance. Under the proposed plan this can be done with accuracy. By allowing entry to be made on a basis of the internal value of depreciated currencies existing three months prior to arrival of goods, the importer will have no trouble in knowing the amount of duty to be paid on the shipment when actually received. He is assured thereby that the duties in no instance will exceed that amount thus calculated a considerable time in advance.

"Equalizing exchange duties, once established, could be made to conform to any condition of a depreciated currency. Their use would make it possible to continue the application of the Underwood tariff, pending its scientific readjustment. As the current rates of exchange for depreciated currencies approached figures truly representing their relative purchasing power in the country of issue the equalizing exchange duties would be gradually and automatically, from month to month, reduced, and finally be eliminated entirely. The arrangement would act as an incentive to countries striving to bring about this equalization. Incidentally, the United States tariff problem would be immediately solved, and American firms enabled to compete with manufacturers in countries having depreciated currencies, two accomplishments which are essential to the return of normalcy in American industry."

RUBBER TRADE INQUIRIES

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

(948) Addresses of rubber band manufacturers and manufacturers of druggists' and stationers' supplies are requested.

(949) An inquiry has been received for the addresses of manufacturers of transparent nipples.

(950) A reader desires to communicate with manufacturers of golf-ball winding and thread-cutting machines.

(951) A manufacturer requests addresses of firms selling or manufacturing cardboard tubes to place over inner-tube valves; also bags for inner tubes.

(952) Addresses are desired of manufacturers of men's rubber belts.

(953) A correspondent inquires for addresses of manufacturers of machines for ball sizing and rolling in manufacturing chewing gum.

(954) Manufacturers of pure gum household aprons and other specialties are requested to send addresses.

(955) A correspondent requires addresses of concerns making rubber dating stamps and rubber bands for dating stamps.

(956) Request is made for the addresses of manufacturers of rubber handles for stamps.

(957) The addresses are requested of manufacturers of machines for rolling rubber balls from raw stock before molding.

(958) A dealer desires addresses of American manufacturers of rubber toys such as dolls, sponge balls, animals, etc.

(959) A manufacturer wishes addresses of makers of large mittens of durable outside material and non-conductors of heat, suitable for handling hot molds weighing 75 pounds or more.

(960) A reader desires addresses of bathing-cap manufacturers.

(961) An inquiry has been received for addresses of manufacturers of rubber chair-tips.

Trade Opportunities from Consular Reports

Addresses may be obtained from the Bureau of Foreign and Domestic Commerce, Washington, D. C., or from the following district or cooperative offices. Requests for each address should be on a separate sheet and state number.

DISTRICT OFFICES.

New York: 734 Customhouse.
Boston: 1801 Customhouse.
Chicago: 504 Federal Building.
St. Louis: 402 Third National Bank Building.
New Orleans: 1020 Hibernia Bank Building.
San Francisco: 307 Customhouse.
Seattle: 848 Henry Building.

COOPERATIVE OFFICES.

Cleveland: Chamber of Commerce.
Cincinnati: Chamber of Commerce; General Freight Agent, Southern Railway, 96 Ingalls Building.
Dayton, Ohio: Dayton Chamber of Commerce.
Los Angeles: Chamber of Commerce.
Philadelphia: Chamber of Commerce.
Portland, Oregon: Chamber of Commerce.

(346) A firm of commercial agencies in South Africa desires to purchase and secure an agency for the sale of floor and wall tiles, of cork and rubber, of all descriptions and sizes. Quote c. i. f. Durban. Payment against documents.

(408) A firm of importers in Sweden desires to secure the representation of manufacturers or wholesalers of balata belting, asbestos goods, cotton duck canvas, belting, rubber goods, etc. Quote c. i. f. Swedish ports.

(416) The agency and purchase is desired by a mercantile firm in Norway of electrical apparatus and supplies, cables, etc.

(428) A manufacturing company in Ireland desires to purchase all goods suitable for a mail-order business, including fountain pens. Quote c. i. f. Irish port. Cash on delivery.

(444) A firm of general merchants in Italy desires to secure an agency for the sale of imitation leathers and rubber articles. Quote c. i. f. Genoa or other ports in Italy.

Trade Lists Available

On reference to the following numbers, any of the offices of the Bureau of Foreign and Domestic Commerce will furnish a list of importers of and dealers in the articles named for the countries indicated. These lists have been prepared by the Commercial Intelligence Division.

(EUR-1014) Belgium. Automobiles, tires, motorcycles and accessories.

(LA-38004) Porto Rico. Motor cars, tires and accessories.

EGYPTIAN COTTON CROP ESTIMATED

The latest estimate made regarding the Egyptian cotton crop for 1921-1922, is 3,300,000 cantars, equivalent to about 467,863 bales of 720 pounds each. This estimate corresponds with the preliminary figure issued by the Egyptian Government on October 31. It is further noted that decrees restricting the area to be planted in cotton have been extended to be effective during the 1922-23 season, as "the decreased acreage for the past year has resulted in a substantial increase in the price of long-staple Egyptian cotton."

The Manufacture of Battery Jar Covers

By William Roberts[1]

THE making of battery jar covers is somewhat different from the method of making battery jars. Every maker has a different style of cover. The maker of a jar can usually be identified by its cover or terminals. There are hundreds of different styles of covers, each style depending upon what the battery is going to be used for. The principal applications of batteries, other than their use in connection with gasoline and electric automobiles, are for home lighting outfits, for country lodges, burglar alarms, electric elevators, etc.

Making Hard Rubber Dust

In making the covers a great deal of hard rubber dust is used. This dust is obtained by grinding up rejected battery jars, covers and other miscellaneous molded articles. There are serious objections to the method of manufacturing hard rubber dust by the use of emery wheels. Particles of these wheels are bound to break up and get mixed with the dust. These particles of emery will cause defective battery jars and covers as they will not stand up to the electric test.

The best method known of manufacturing hard rubber dust is to break up the scrap in a pulverizer to about the size of peas and then feed this scrap into refiners, the rolls running about 10 and 13 revolutions per minute, respectively. The material should then be spread out in large pans and mixed with a hoe as spontaneous combustion sometimes sets the dust on fire, or heat in the dust causes vulcanization, forming large lumps. After the dust is sufficiently cool it is then passed through sifters that produce the various grades of dust.

Some manufacturers run the dust over a magnet or separator which collects all the metal particles, and thus eliminates the rejections that follow when the finished products are imperfect through the presence of metal.

Preparing the Hard Rubber Stock

After the stock is compounded it is warmed in a mill shown at *A* and then fed into the calender *B*. To insure uniformity of thickness and eliminate air pockets, the stock is plied up on the drum *C*. This drum runs at the same speed as the calender, and is about 42 inches in diameter and water-cooled. The plied stock is then cut from the drum and removed by means of the conveyor *D*, when it is laid in trays.

Molding the Covers

The raw stock is then cut to size and the pieces are placed in molds which are made of cast iron or steel. The molds should always be designed to use up all the space on the platen of the presses used for curing. Bear in mind the weight of the molds so that they can be easily handled by the operators. Before loading the molds with raw stock they should be brushed with a solution of water, soap and silicate to keep the finished covers from sticking to the mold after they are cured. A very good plan is to cover the raw material with rubber dust before placing in the mold. This acts as a sort of lubricant and allows the uncured rubber to enter all crevices to make up the finished form of the jar cover.

Most jar covers are designed with three holes, the two end holes for terminals and the center hole for allowing the replenishing of acid and distilled water and air. These holes are molded if possible as it is quite a task to machine them after being cured. It is therefore best to make uncured stock as near the shape of the cover as possible. An ordinary punch press may be used for perforating.

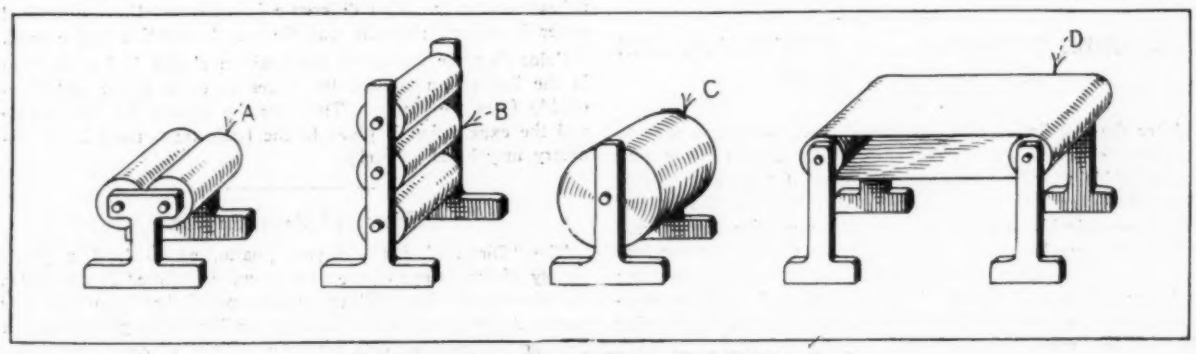
The B. F. Goodrich Co.

Typical Battery Jar Covers

Finishing the Covers

After the covers are cured and cooled, the overflow should be ground off. This is done on ordinary standard disk or belt grinders. Vent holes of small diameter are sometimes drilled in the finished covers. A high speed drill press is then required with a large number of drills. Fifteen or twenty covers are the maximum that can be drilled with one drill and then it must be sharpened. So as not to delay production, the operator should always have at least two or three dozen sharp drills on hand.

The covers are tested for tensile strength only. This is done by cutting out the piece of standard size and shape and putting it through the same test as given the battery jars. Boxes for transporting covers should be standardized.

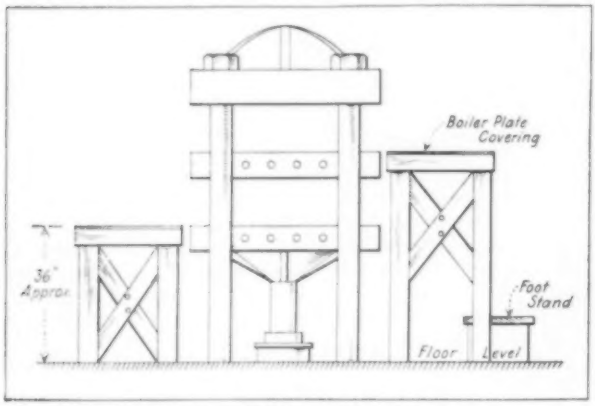


Machines for Sheeting and Plying Hard Rubber Stock

[1]Consulting production and efficiency engineer, Springfield, Massachusetts.

Molding the Vent Cap

The vent cap is made in a mold which weighs about 150 pounds, therefore lifting handles are necessary. Vent caps are cured in the same manner as the covers, the blanks being made on a toggle press with a hand punch. Another method is to run a



Hard Rubber Molding and Curing Press

rod of stock of the correct diameter from a tubing machine, and cut it into disks with a slicing machine similar to a bread slicer.

To unload the mold, each cap has to be unscrewed, and the overflow should then be removed. This can be done one at a time by holding the cap against the face of a small disk grinder, or an automatic arrangement can be made to grind off the overflow. The caps are then inspected for thread size and appearance and assembled with the covers. The maker's name on the battery jar vent caps should appear very clearly, as it is most essential.

The Press Room

An ideal plan for a press installation is shown in the illustration, the number of presses required depending on the length of the cure and the production. The tables are level with each platen when the hydraulic is off. This does away with lifting heavy, hot molds and minimizes accidents and increases production. A gang of men work on each side of the presses. If the cure is one hour, two men can take care of four presses by setting each press at 15-minute intervals. If an operator does not have all the molds unloaded and reloaded in the specified time he is to put back as many molds as he has ready and prepare the mold for the next cure. In this manner a piece work system can easily be worked out.

VULCANIZING TROUBLES ON MULTIPLE-PLATEN HYDRAULIC PRESSES

By W. J. Bitterlich

After the installation of a number of new, two-platen presses, considerable trouble was experienced with uneven cures that showed a bloom only on one side of many of the water bottles. Plugs and pipes were removed from the platens and the interior was thoroughly blown out to remove all traces of core sand and grit; traps were by-passed to insure steady circulation; pressure gages and temperature recorders were checked up for accuracy and installed on each platen. They all indicated equal temperatures and in no case varied more than 1 or 2 degrees F., showing that perfect cures should result.

Ordinarily, even temperatures are easily maintained in presses because of the ready thermal conductivity of cast iron, yet many of the bottles continued to show bloom on one side. For some time this condition baffled every effort to improve the cure and finally the plugs and pipes of the platens were again removed for further examination.

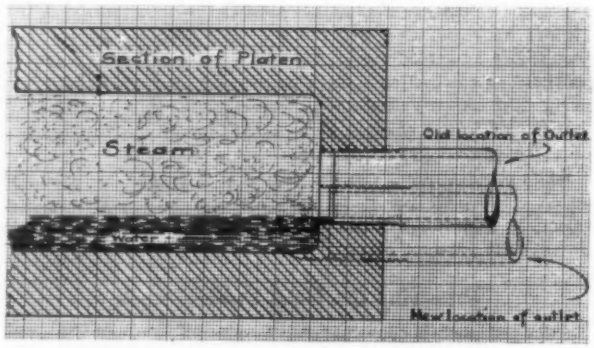
On close investigation it was noticed that the inside bottom of the return, or outlet pipe, in some of the platens was from ¼ to ½ inch above the bottom of the steam chamber of the platen, as shown in the accompanying illustration. This caused a film of water to remain in the bottom of the platen, and the steam had to pass through the water before it was transmitted to the platen surface and then to the mold and stock.

Analyzing the functions of this condition it is noted according to Marks that the specific heat of cast iron at a temperature of 330 degrees F. = 0.127 of water at 330 degrees F. (temperature of steam used) = 1.038. This signifies that it requires in excess of 8 times as many heat units to raise the temperature of the water to the same temperature of the cast iron, and furthermore, it was necessary for the steam to pass through the water before reaching the cast iron where the heat for vulcanization is required.

Experiments made by Despretz prove that the conductivity of heat in liquids obeys the same laws as in solids but is much more feeble. For example, he found the conductivity of water to be 1/95 that of copper, and of cast iron, 1/2.4 that of copper. Marks shows a greater difference, which is probably due to greater changes in temperatures and velocities of the liquid and temperatures of the metals, as follows:

Copper, thermal conductivity at 212 degrees = 220.
Cast iron, thermal conductivity at 216 degrees = 26.8.
Water, thermal conductivity at 77 degrees = .033.

The object in showing these figures is to make apparent the great difference between cast iron and water in the conductivity



Proper Location of Outlet in Platen Presses

of heat and to show the superiority of cast iron over water as a heat conductor. This difference is accentuated when distilled water is present, and this was the actual condition that existed.

Relocating the outlets to the position shown in broken lines in the illustration allowed the water to drain easily and thoroughly from the platens. This was the remedy for the trouble and the explanation is given to the trade that others in the industry may benefit thereby.

"Dictator" Fountain Pens

The "Dictator" fountain pen, guaranteed to hold a year's supply of ink, is one of the new inventions offered to the public. A concentrated ink, said to be waterproof, has been especially prepared for this pen, and makes possible its long use without refilling. Once filled with a tube of "Dictator" concentrated ink, which, dissolved in water, makes a pint of the best writing fluid, the pen is equipped with a year's supply. On simply dipping the pen into water or any other fluid it is at once ready for use. A "Dictator" pencil, warranted to hold a year's supply of lead, is another article manufactured by the same company. The pens are produced in 161 styles.—The Dictator Fountain Pen Co., Inc., 342 Madison avenue, New York, N. Y.

What the Rubber Chemists Are Doing

The Discontinuity of Vulcanization in the Presence of Organic Accelerators[1]

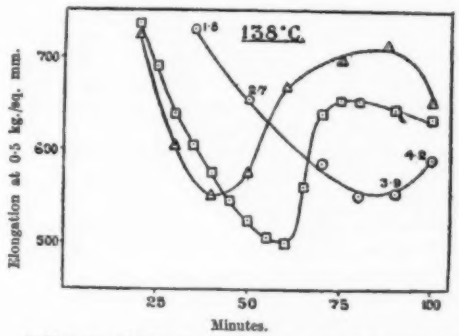
IN a recent paper[2] S. A. Brazier and the author reported some observations on the vulcanization of a mixture of rubber and sulphur (90:10) in the presence of 0.5 per cent of hexamethylene tetramine, with and without the addition of 1 per cent of zinc oxide; in the presence of the zinc oxide the points representing the extensibility at a load of 0.5-kg. per sq. mm. after various periods of vulcanization, did not agree so well with the course of a smooth curve as did those for the same standard rubber-sulphur mixing alone, or as those for this mixing with either the zinc oxide or hexamethylene tetramine separately. This irregularity found a more detailed description a little later by Twiss and Howson[3], when it was shown that with a similar rubber-sulphur mixing containing 1 per cent of hexamethylene tetramine and 1 per cent of zinc oxide the actual course of the curve representing the extension of the rubber at a load of 0.5-kg. per sq. mm. is roughly S-shaped, the extent of the elongation with progressive vulcanization first decreasing to a minimum, then increasing to a maximum, and finally decreasing once more. The inflection in the curve is surprising because it has generally been assumed that the extensibility of rubber decreases steadily with progressive vulcanization.

For the vulcanization of most mixtures the decrease in extensibility is indeed continuous, but the curve obtained on plotting the extensibility against the period of vulcanization does not always have the simple course, almost rectilinear during the earlier stages, given by plain mixtures of rubber and sulphur. In the presence of some organic accelerators, especially in the presence of zinc oxide, the relationship is frequently far from rectilinear.

The irregularity, however, in the case of the hexamethylene tetramine mixing referred to above is exceptional in character because the ordinary effect of vulcanization appears temporarily to be reversed. The phenomenon is not an example of "reversion" or mere increase of extensibility caused by prolonged heating after the consumption of the free sulphur. This is obvious from the fact that the normal effect reasserts itself later. No explanation of the observed facts was offered earlier, but the following considerations appear to throw considerable light on the matter.

For the occurrence of the abnormality of behavior during vulcanization the proportion of the accelerator is immaterial within reasonable limits, namely 0.5 per cent and 2.5 per cent of hexamethylene tetramine in the presence of 1 per cent of zinc oxide show it equally well, Fig. 1[4]. It is surprising, however, that if the proportion of zinc oxide is increased to as little as 2 per cent, the abnormality disappears; the extensibility curve then comes down with a continuous sweep giving no sign whatever of any reversal of direction (Fig. 2). With 0.5 per cent of zinc oxide the behavior is similar to that of the mixing containing 1 per cent.

There are evidently three distinct sections to the S-curve under consideration. The first and last are accompanied by decrease in extensibility and presumably represent behavior approximating to the normal, except that in the first section the physical effect is exceptionally rapid and in the last section relatively slow. The abnormality is essentially restricted to the short ascending middle section, throughout which further "vulcanization" effects an increase in the extensibility. It would appear, therefore, that

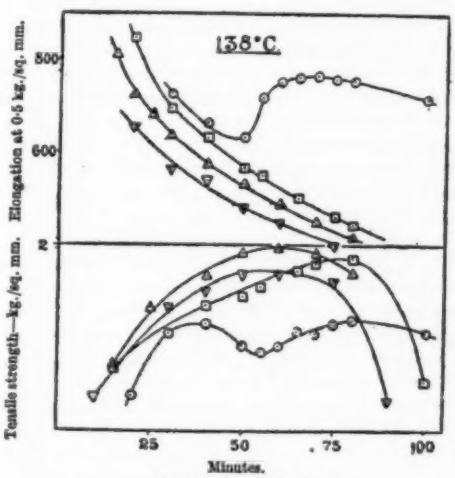


Rubber 90, sulphur 10, zinc oxide 1, hexamethylenetetramine (○) 0·5%, (□) 1%, (△) 2·5%.
Vulcanisation coefficients inset for curve ○.

Fig. 1

under the conditions in question two periods of more or less normal vulcanization behavior became separated by the occurrence of an abnormal softening effect in the rubber such as can conveniently, although possibly not correctly, be termed "depolymerization."

As was shown in the earlier communication[3], this "depolymerization" process occurs while there yet remains more than 4 per cent of free sulphur, which is indeed responsible for the subsequent return of the curve to a normal course. If this additional sulphur could be diminished in quantity, the upward section of the curve should be extended and show a more marked "depolymerization" effect.



Rubber 90, sulphur 10.
○ + hexamethylenetetramine 1, zinc oxide 0·5.
□ " 1, " " 2.
△ " 1, " " 5.
▽ " 2·5, " " 5.

Fig. 2

The discontinuity in the extensibility curve for the mixing containing hexamethylene tetramine consequently cannot be ex-

[1] Abstracted from a paper by D. F. Twiss, Journal of the Society of Chemical Industry, October 31, 1921, 242 T.
[2] Journal of the Society of Chemical Industry, 1920, 125 T.
[3] Journal of the Society of Chemical Industry, 1920, 287 T.
[4] For convenience of comparison it should be stated that the rubber used throughout these experiments when mixed with sulphur alone, in the proportion 90:10, needed vulcanization for about 90 minutes at 148 degrees C. for the attainment of maximum tensile strength or an extensibility of 650 per cent at 0.5 kg. per sq. mm.

plained merely by "reversion," or softening caused by overheating.

The evidence renders it probable that during vulcanization of the mixtures represented in Fig. 1, hexamethylene tetramine gives rise to some substance capable of effecting the depolymerization of rubber. This fact is of particular interest because although the view has been expressed that accelerators of vulcanization also accelerate the removal of combined sulphur from vulcanized rubber, and therefore aid "reclaiming"[5] the depolymerization effect produced by hexamethylene tetramine, which resembles a reclaiming process in that it is accompanied by an increase in the extensibility of the rubber, occurs without the removal of combined sulphur, and indeed may occur while sulphur is still entering into combination.

Closer examination of some of the earlier experimental results confirms this remarkable conclusion that hexamethylene tetramine can induce in vulcanized rubber, while vulcanization—in the sense of combination with sulphur—is still proceeding, a physical alteration which is the reverse of that customarily associated with vulcanization.

It is remarkable that the presence of undissolved solid matter seems to be necessary for the development of the curve. Not only zinc oxide, but also lampblack, gas black, and china clay all induce this abnormality over a wide range of percentages.

The effect of the presence of an inert powder such as that of gas black, lampblack, clay, or zinc oxide alone, on a reaction occurring in the surrounding medium is not exceptional and other cases are well known, being commonly attributed to the influence of surface energy.

Of the numerous accelerators tested so far hexamethylene tetramine appears to be the only one giving good tensile strength for soft rubbers at very high vulcanization coefficients. It is therefore probable that the characteristic responsible for the abnormal course of vulcanization represented by Fig. 1 is not exhibited to a comparable degree by the other accelerators commonly used.

The lower initial rate of vulcanization with hexamethylene tetramine alone and the absence of any minimum in the extensibility curve, indicate the probability that not the hexamethylene tetramine itself, but some decomposition product is the accelerator. Probably for this reason the "depolymerization" section of the vulcanization curve with hexamethylene tetramine and 10 per cent sulphur is not observed when more than 1 per cent of zinc oxide is present; the formation of the direct catalyst is then favored so that less of the hexamethylene tetramine becomes available for decomposition into the unstable depolymerization agent. Possibly also the depolymerization agent is acidic and excess of zinc oxide may tend to annul the activity of any small quantity that may be formed. These views receive support from the fact that the position of the maximum in the tensile strength curve given in Fig. 2 for the mixing containing 5 per cent of zinc oxide occurs at a vulcanization coefficient between 4 and 5, thus giving an indication of the absence of depolymerization in the presence of larger proportions of zinc oxide.

That other accelerators do give rise in a milder degree to the phenomenon shown by hexamethylene tetramine is very probable. In several cases of comparable mixings containing rubber and sulphur in the proportion 90:10, together with an organic accelerator and 1 per cent of zinc oxide, although the extensibility curve may not assume a sharp minimum and maximum, there is observable a distinct temporary change of direction in the curves. Presumably in these cases also, a decomposition product of the accelerator is responsible, but none is capable of effecting such strong depolymerization as occurs with hexamethylene tetramine under suitable conditions.

Comparative experiments of a number of accelerators, with and without zinc oxide, duplicated in marked degree the effect of discontinuity of vulcanization noted with hexamethylene and zinc oxide. The accelerators used were *p*-toluidine, *o*-toluidine, aniline, carbo-*p*-toluidine.

The dithiocarbamate class of accelerators, of which the commonest are obtained by the interaction of secondary amines with carbon bisulphide, also give exceptional behavior in the presence of zinc oxide. When used alone in a rubber-sulphur mixing they act as moderate accelerators and the extensibility curve shows no marked inflection. When one per cent of zinc oxide is introduced into the mixing there is a very rapid physical change for a short period at the commencement of vulcanization, followed by an almost stagnant condition, although the fixation of sulphur proceeds steadily. With more zinc oxide the extensibility curve sweeps downward steadily with a marked bow.

Experiments with mixings containing other organic accelerators, namely, *p*-nitrosodimethyl aniline, aldehyde ammonia, *p*-phenylenediamine, quinoidine, anhydroformaldehyde aniline, and diacetonamine, likewise, in the absence of zinc oxide show that the extensibility at 0.5-kg. per sq. mm. is a linear function of the period of vulcanization, but that with the addition of 1 per cent of zinc oxide the extensibility curve has a contour somewhat resembling the corresponding curve for furfuramide. With a higher proportion of zinc oxide the extensibility in each case tends to decrease continuously with progressive vulcanization, but the representative curve is never rectilinear.

Scott and Bedford[6] have divided the organic accelerators into two classes, distinguishing between (a) those which on account merely of basic character act by first forming hydrosulphides, and (b) those which contain or develop the carbosulphydryl group :C.SH. Both classes are believed to act by adding sulphur with formation of "polysulphides" capable of liberating the additional sulphur in an active form for vulcanization.

The view of Scott and Bedford with respect to class (b) has undergone subsequent modification because in a paper by Bedford and Sebrill[7] the suggestion is made that the mechanism of the carbosulphydryl accelerators involves the formation of very active zinc salts. This is in agreement with a more detailed and independent explanation by Bruni and Romani in which it is held that the accelerators of class (b) function by the direct or indirect formation of zinc salts which are capable of behaving as "ultra-accelerators"; thus zinc alkyldithiocarbamates, applied as such or formed during vulcanization from an alkylammonium alkyldithiocarbamate and zinc oxide, are exceptionally powerful[8]. The action is believed to depend on conversion by sulphur into the corresponding thiouramdisulphide which forms the vulcanizing agent functioning by decomposition with scission of sulphur in an exceptionally active form for vulcanization. By repeated regeneration from its decomposition products and free sulphur it is able to supply a relatively large quantity of sulphur to the rubber.

According to Scott and Bedford, hexamethylene tetramine belongs to both groups (a) and (b), and acts by giving rise to decomposition products which in part undergo further conversion into a hydrosulphide and in part to a carbosulphydryl compound, probably a dithiocarbamic acid derivative which will then undergo conversion into a zinc salt. The behavior of this and other accelerators is, however, evidently still far from fully investigated, and the identity of the agent responsible for the depolymerization effect observable still requires to be ascertained by further investigation.

The view of Bruni and Romani as to the effect of many organic accelerators being attributable to the formation of a compound which is capable of supplying active sulphur is satisfactorily applicable to the above described irregularity in the

[5] Spence, English patent No. 126,397, 1919.

[6] *Journal of Industrial and Engineering Chemistry*, 1921, 13, 125.

[7] *Chemical and Metallurgical Engineering*, 1921, 24, 835.

[8] Later experiments by Mr. F. Thomas show tetramethylthiouram disulphide and zinc diethyldithiocarbamate also to give similar sets of curves; it is remarkable that the latter, even in the absence of zinc oxide, is but little more active than the alkylammonium alkyldithiocarbamates under comparable conditions.

course of the action of various organic accelerators in the presence of a limited proportion of zinc oxide. The interaction of the zinc oxide with the accelerator to give rise to the necessary intermediate compounds, capable of imparting sulphur in an active form to the rubber, must of necessity be rapid, and its effect will be seen from the earliest stages of the vulcanization process. In the presence of a restricted amount of zinc oxide, however, the formation of the intermediate product or its regeneration from its decomposition products will soon cease, probably by conversion of the essential zinc oxide into the ineffective zinc sulphide. In such a case, therefore, the rapid initial rate of vulcanization will soon disappear and the extensibility curve will develop a sharp bend and assume a more nearly horizontal course. If at the same time a "depolymerizing" agent is formed among the decomposition products of the accelerator, the curve may even assume an upward trend as it does with hexamethylene tetramine; as soon as the depolymerizing agent has disappeared by further decomposition, the ordinary effects of vulcanization again begin to appear. The extraordinary modification of the almost straight extensibility curve of the plain rubber-sulphur mixing thus finds a complete explanation.

Summary

The foregoing results generally indicate the remarkable effectiveness of zinc oxide in modifying or developing the activity of many organic accelerators of vulcanization, particularly those recognized as belonging to the dithiocarbamate or "carbosulphhydryl-polysulphide" class. Other basic oxides are not so effective and the peculiar power of zinc oxide is explained by its ability to form intermediate compounds of the requisite degree of stability or instability. The observation that zinc oxide is less effective in increasing the activity of certain organic accelerators such as aldehyde ammonia is to be attributed to their activity being more particularly of the "hydrosulphide-polysulphide" type. The fact that the progress of vulcanization, as evidenced by the slope of the extensibility curve, undergoes temporary retardation after a short initial period, suggests that even in the case of aldehyde ammonia, the zinc oxide causes a modification of the mechanism of the accelerating effect and that there may be temporary formation of a small quantity of "depolymerizing" agent. Probably all organic vulcanization catalysts when used in conjunction with zinc oxide act to some extent as "carbosulphhydryl-polysulphide" accelerators. In this connection it is noteworthy that with the potashglycerol accelerator in which the glycerol merely forms the solvent, the indication of any such arrest in the progress of vulcanization with a small proportion of zinc oxide is almost entirely wanting. The behavior of potassium hydroxide therefore provides an almost pure example of the "hydrosulphide-polysulphide type"; the same statement can be applied in perhaps a somewhat more moderate degree to sodium phenoxide and magnesium oxide which in the proportion of 1 per cent with 1 per cent of zinc oxide in a 90:10 rubber-sulphur mixing give rise to an extensibility curve diverging but little from that of a similar mixing without the zinc oxide.

It is possible indeed that the degree of dependence of an accelerator on zinc oxide for the development of its full activity and its behavior in the presence of a small proportion, namely, 1 per cent, of zinc oxide may be of value in enabling a decision to be reached as to the extent to which an accelerator is to be assigned to the "carbosulphhydryl" and "hydrosulphide" class, respectively.

THE UTILIZATION OF WASTE SLATE AS A FILLER[1]

The percentage of waste at slate quarries is very high, and the Bureau of Mines has undertaken the problem of discovering new and enlarged outlets for the waste material.

[1] Reports of Investigations. Serial No. 2283. Bureau of Mines, Washington, D. C.

In the absence of facilities for conducting exhaustive tests of this character the cooperation of a number of rubber manufacturing companies was enlisted.

Eighty per cent of the pulverized slate submitted for testing as a rubber filler would pass through a 200-mesh screen. Samples were submitted to 27 rubber companies. Eighteen reports have been received from manufacturers of various classes of mechanical rubber goods. Of these reports seven were unfavorable and 11 were favorable. It was claimed by those reporting unfavorably that the resulting rubber was inferior in tensile strength, stretch, and wearing quality. One manufacturer claimed that slate flour made the product dry and hard, with a tendency to crack. Several reports stated that the slate submitted was insufficiently ground, and that finer grained filler would give better results. Only one manufacturer expressed a preference for coarse grained filler.

Slate Flour Compared with Soapstone

Slate flour was tested as a filler in comparison with soapstone after the following formula: smoked sheets, 40; magnesium oxide, 2; sulphur, 3.5; soapstone, 54.5. Specimens of the sample mixings 0.1-inch thick were cured 75 minutes at 50 pounds of steam.

Physical tests of the product containing soapstone gave 1,315 pounds tensile strength, and 525 per cent elongation; that containing slate flour 774 pounds tensile strength and 270 per cent elongation. These results indicate that slate flour is inferior to soapstone as a filler, though the coarseness of grain may have had some influence on the results obtained.

A series of tests reported by a rubber manufacturer is of interest. For comparative tests three rubbers were compounded, one containing 40 per cent whiting, a second 40 per cent clay, and a third 40 per cent slate flour. The results of tests made on the rubbers thus compounded are shown in the following table:

	Thickness Inches	Elongation Inches	Tensile Strength Pounds
Whiting as filler	0.136	9	850
Clay as filler	0.188	6½	850
Slate flour as filler	0.160	9½	850

Value in Mechanicals, Footwear, Tape, Etc.

Eleven manufacturers of mechanical rubber goods found slate flour a satisfactory filler for disks, sheet packings, heels and soles, hard rubber battery jars, carriage tires, garden hose, clutch facings and similar products. Slate flour was used successfully as a substitute for whiting, clay, ground barytes and aluminum silicate. A rubber footwear manufacturer found that products in which slate was used compared favorably with those made from regular compounds, in tensile strength, elongation, and accelerated or natural aging, but repeated stretching caused the rubber to break more readily than when regular compounds were employed. The chemist in charge of the tests concluded that this latter quality was due to the coarseness of the slate filler, and suggested that finer grinding would overcome the difficulty.

A manufacturer of mechanical rubber goods, tubing, friction and rubber tape found that slate flour could be substituted in gray and black products for whiting, quoted in 1921 at $13 to $16 a ton.

A sample of slate pulverized so that 95 per cent would pass through a 200-mesh screen and 90 per cent through a 300-mesh screen was supplied to one rubber company. As a result of tests made on rubber compounded with this filler, the opinion was expressed that slate flour was not quite as good as high-grade clay, but gave better results than whiting or ground barytes.

Conclusion

The difference of opinion evident from the reports quoted may be largely due to insufficient grinding of the slate flour submitted for testing purposes. At the time most of the tests were made the Bureau found it impossible to obtain slate flour which would analyze finer than 80 per cent through 200 mesh. The results of the tests, together with opinions expressed by several rubber

chemists, indicate that if slate flour of much finer grade had been used the results would have been more uniformly favorable.

RUBBER-CELLULOID—A NEW PRODUCT

Celluloid-caoutchouc and cellou-caoutchouc are two new elastic materials described by R. Ditmar[1] as follows:

The difficulty of preparing a celluloid-caoutchouc material which would combine the valuable properties of both these substances has lain hitherto in the absence of a solvent in which they are mutually soluble. The hydrogenation products of naphthalene and phenol are now found to supply this deficiency, and the desired product may be obtained by mixing in any required proportions solutions of caoutchouc and celluloid or cellulose esters in hexalin (cyclohexanol) for example.

The new product has many valuable properties, and in the liquid form can be dyed with inorganic colors and used as a lacquer for all purposes. The material itself can be used in the manufacture of photographic and cinematograph films, linoleum, and all similar articles where it is desirable to eliminate the brittle character of the celluloid without introducing the springiness of the caoutchouc.

[1]Chemische-Zeitung, 1921, 45, 819-820.

CHEMICAL PATENTS

The United States

MIXING RUBBER WITH COMMINUTED METAL. A COMPOSITION of matter comprising vulcanized rubber through which is distributed finely divided lead whose individual particles are immediately surrounded by rubber containing petrolatum.—Henry A. Hoffman and Walter H. June, Akron, assignors to The B. F. Goodrich Co., New York, N. Y. United States patent No. 1,395,413.

COMPOUNDING RUBBER COMPOUNDS. THE PRODUCTION OF RUBBER containing proteids and finely divided ingredients; the mixing method which consists in preparing a dispersion of the proteid, containing an emulsifying agent capable of retarding the removal of the dispersion vehicle; mixing the finely divided solid therewith and then incorporating the whole into the rubber.—Robert C. Hartong, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio. United States patent No. 1,396,837.

CHEWING GUM CONTAINING PLASTIC RUBBER OF DIFFERENT DEGREES of depolymerization uniformly distributed through the gum.—Adolph Phillip Rapp, New York, N. Y. United States patent No. 1,397,742.

The United Kingdom

PURIFYING RUBBER. MINERAL IMPURITIES SUCH AS SAND ARE removed from India rubber, gutta percha, etc., by treatment with hydrofluoric acid in presence of water. The rubber, etc., may be sheeted and immersed in a solution of the acid, or exposed to the gas if it is already moist, or it may be masticated with the acid. A suitable concentration is 8 to 10 per cent.—C. H. Gray, of India Rubber, Gutta Percha & Telegraph Works Co., Limited, Silvertown, London. British patent No. 166,359.

TIRE COMPOSITION FOR STOPPING LEAKS. CONSISTS OF A SOLUTION of two ounces of rubber in a solvent, such as benzol, mixed with an equal weight of chalk, paper or rags, and river mud or clay ground together in equal proportions.—R. L. Marshallsay, and P. J. Aslatt, Mooregreen House, West End, Southampton, London. British patent No. 166,463.

SULPHUR-TERPENE COMPOUNDS. TERPENES, OR CERTAIN DERIVatives such as terpineol, or rosin, are heated with sulphur to produce brittle solids, or semi-solids according to the duration of the heating. The products form non-colloidal solutions and may be used either alone or in toluene, xylene, etc., solution with or without addition of rubber, for coating or impregnating materials. They may also be vulcanized onto or with rubber and can be molded.—W. B. Pratt, Wellesley, Massachusetts, U. S. A. British patent No. 169,513.

COMPOUND SHEET MATERIAL MADE BY VULCANIZING A SHEET of rubber to a sheet of fibrous material which has been treated with a neutral, amorphous, non-colloidal sulphur-turpene compound capable of combining with the rubber during vulcanization.—W. B. Pratt, Wellesley, Massachusetts, U. S. A. British patent No. 169,031.

WHEEL TIRE JACKETS OR COVERS. THE CORD OR WOVEN FABRIC to be used in the carcass of a pneumatic tire is treated with a solution of a neutral amorphous non-colloidal sulphur-terpene compound which is capable of reacting with rubber on vulcanization.—W. B. Pratt, Wellesley, Massachusetts, U. S. A. British patent No. 169,154.

IMPREGNATING COMPOSITIONS OF ORGANIC SULPHUR COMPOUNDS. A sulphur-terpene compound of the kind described in specification No. 169,513.—W. B. Pratt, Wellesley, Massachusetts, U. S. A. British patent No. 169,777.

OTHER CHEMICAL PATENTS

Germany

Patents Issued with Dates of Issue

345,160 (February 26, 1917) Method for improving the properties of vulcanized rubbers. Farbenfabriken formerly Friedrich Bayer & Co., Leverkusen, near Köln-on-the-Rhine.

LABORATORY APPARATUS

Apparatus for Recovery of Alcohol

It is common practice when determining alcohol and ether solubles simply to place the extract in a platinum dish and evaporate to dryness over an electric hot-plate or a steam bath. In this way not only is the solvent lost but a hazard is created since these vapors diffused with air constitute an explosive mixture.

Solvent-Recovery Apparatus

The apparatus shown here can be readily assembled from ordinary laboratory equipment and is highly efficient in the recovery of solvents. It is advisable, however, to have the condenser of the spiral variety. The suction at the receiver not only serves to convey the vapors through the condenser but speeds up the vaporization since it constantly relieves the vapor pressure at the collecting funnel.—Raymond Szymanowitz in *The Chemist-Analyst*.

GENERATING HYDROGEN SULPHIDE

The following note on the generation of hydrogen sulphide for laboratory use is credited to H. G. Uhleman, M. D., U. S. A., Fort Hancock, New Jersey, in *The Chemist-Analyst*.

Perhaps the best method for generating the hydrogen sulphide for laboratory work is by the action of water on aluminium sulphide.

Aluminium sulphide cannot be made the wet way but can be made by direct fusion of sulphur and aluminium in molecular weight proportions. Thus by fusion of 54 grams of aluminium filings and 96 grams of sulphur 150 grams of Al_2S_3 is produced. When the sulphide so made is thrown upon water hydrogen sulphide is immediately evolved according to the equation as follows:

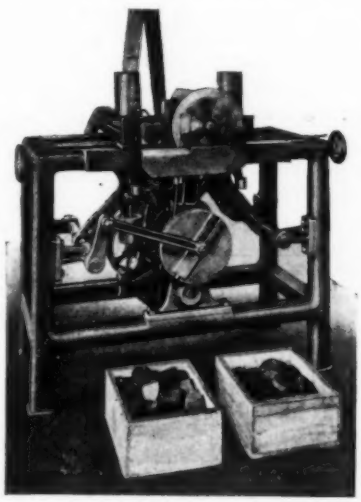
$$Al_2S_3 \text{ plus } 3H_2O \text{ equals } Al_2O_3 \text{ plus } 3H_2S$$

In the laboratory a large carboy is half filled with water and a holed stopper with a bent glass tube is inserted into the neck. Whenever hydrogen sulphide is needed a small lump of aluminium sulphide is thrown into the water and the gas is rapidly evolved.

New Machines and Appliances

Automatic Rubber Stock Cutter

A RUBBER stock cutter built for the high production demanded in the manufacture of rubber heels and other molded products, is shown in the accompanying illustration. Its range covers all sizes and shapes of rubber stock up to 3¼ inches in diameter.



Black Rock Stock Cutter

For heel cutting the machine is supplied with accurately - run tubing - machine stock which is fed by profile rolls through a pair of close-fitting dies, one each side of a revolving disk cutter which oscillates close to the dies, cutting the stock as it feeds forward, and producing mold blanks of accurately uniform thickness.

It is of special interest that this machine will cut automatically any shape and size of extruded stock even including that for hoof-pads, and that the feed may be accurately controlled and adjusted while in motion, with entire safety to the operator.

Diameter of Stock in Inches	Strips of Stock Each Side of Disk	Pieces Cut Per Minute
Up to ⅝	5	600
Up to 1	3	360
Up to 1½	2	240

The cutting capacity is rated as above for various sizes of stock, with 60 oscillations of the cutting disk, either side producing 120 cuts per minute.—The Black Rock Manufacturing Co., Bridgeport, Connecticut.

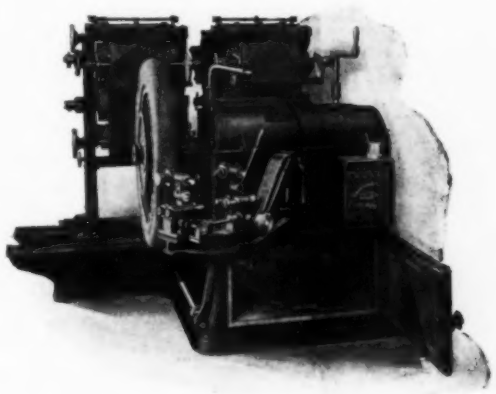
Perfected Cord-Tire Machine

The "Universal" tire-building machine here shown has roller bearings throughout, direct motor drive, electric control, and patented features that enable the building of single-ply cord tires with exactness of tension and perfect alinement of the material relative to the core. There are two forward and two reverse speeds, permitting the fabric to be applied either toward or from the operator. The machine is equipped to carry four-ply widths in four stock rolls.

The method of building is as follows: The plies, with a one-thread splice, are assembled on small stock shells, in continuous lengths sufficient to make a roll from 14 to 16 inches in diameter. This roll is supported on a roller-bearing arbor from which, with the least possible strain, the stock is passed under an idle roll, which takes up the liner, and over a table between adjustable guides, where it is positively centered in relation to the core and at the same time marked. From here it passes over an idle roll and around a rubber-covered tension roll.

In building the tire the operator passes the fabric under an adjustable rubber-covered smoothing roll, places the mark on the fabric central on the core and puts the machine in motion. The tendency of single-ply cord fabric to pull out of alinement is neutralized by the position given the spreader or smoothing roll before the core is put in motion. When the core is entirely encircled with the ply of fabric and the splice is made, the machine is started on high speed and the ply stitched down with the cords on one side and then, by reversing, on the other. This operation is repeated until the required number of plies are built into the tire. The bead construction is optional with the manufacturer and has no real bearing on the efficiency of the machine.

This machine is equally efficient on square-woven fabric. It builds any size of pneumatic tire up to and including 5-inch. A small machine known as the "Special" possesses all the features of the "Universal," but builds the smaller sizes only.—The Hermann Tire Building Machine Co., Columbus, Ohio.



The Universal Tire-Building Machine

An Indoor and Outdoor Truck

Most plants are equipped with trucks that can be used only inside or outside the works, necessitating double loading.

A new truck for which is claimed equally satisfactory service both inside and outside the factory is shown in the illustration. It can be used for carrying crude rubber, compounding ingredients, fabrics, cores, molds and finished products of all kinds. The operator is able to move the truck through narrow aisles and in crowded quarters indoors. It can be run upon the average freight elevator, or safely carry its 2½-ton load over city streets. Labor costs are cut to a minimum because no transfers of goods are necessary between indoor and outdoor haulage. The truck handles platforms up to ten feet long which permits capacity loads of bulky goods.

The illustration shows the truck in operation. The truck arrives at the dock with an empty platform. A simple turn and it is lowered to the ground. The truck is backed off and then picks up the loaded platform. Six seconds is required to raise the platform, four seconds to lower it.

The truck has a rugged frame of cast steel. Each wheel has its individual motor drive and is without shaft. The wheels are ball or roller bearing and equipped with solid rubber tires of the usual section used on ordinary street trucks. Exide or Edison storage batteries furnish the motive power. The truck has three speeds forward and three speeds reversed. The average speed, loaded

to capacity, is 7½ miles an hour, or ten miles an hour with a light load. A fifth motor wheel operates the lifting jack. The bumper provided eliminates shocks from accidental knocks. The

The Tec Truck in Operation

operator stands on a platform at the rear, with the steering mechanism and motor drive conveniently placed.—Terminal Engineering Inc., 17 West 44th street, New York, N. Y.

Heavy Hand Shear

The Maxwell Shear

A simple and powerful hand shear for the use of tire repair and rubber scrap men is here illustrated. It is nothing more than a heavy knife suitably mounted to give the powerful leverage needed for cutting through a whole tire after removal of the beads. It will also shear anything pliable and is handy in a battery station for cutting separators to any desired size.—Maxwell Manufacturing Co., Wichita, Kansas.

An Efficient Rotary Pump

The Exeter rotary pump is based upon an entirely new idea of rotary pump construction. The pump creates its own suction, its action is positive, and the flow of the water is continuous. There are no valves nor reciprocating parts to get out of order,

Exeter Rotary Pump

and compared with its output the size of the pump is extraordinarily small.

The pump consists of an outer casing of cylindrical form having a pair of rotors meshing, the inner rotor being keyed to the driving shaft. These two rotors are set eccentric one to the other. The outer rotor has four ports which are open to the chamber of both the suction and discharge side of the pump during rotation. These ports are closed momentarily by a lip at both the top and the bottom of the pump body in order to effect the cut-off between the suction and the discharge of the pump. The liquid is drawn into the pump through the ports of the outer rotor while the pocket is increasing, and forced out at the opposite side of the pump during the last half revolution when the pocket is decreasing.

The pump is self-priming, very easy of installation and can be profitably applied to almost every pumping condition. Dirt and grit do not seem to affect the pump as there is no rubbing or wearing contact. It is especially suitable for handling oil, or gasoline, as well as water. Small pumps thus far tested have shown a sustained volumetric efficiency of 98.67 per cent, and a pumping efficiency of between 70 and 82 per cent.—Exeter Machine Works, Inc., West Pittston, Pennsylvania.

"Tan-Sad" Chair for Workers

The illustration shows a new chair called the Tan-Sad, for office and factory workers. The frame is of steel tubing and the entire chair is adjustable for height of seat and inclination of back rest. The latter automatically swivels to the angle of the worker's back.

A comfortable seat of this character increases the worker's comfort and efficiency. It reduces fatigue by supporting the back at the waist, permitting an erect position and leaving the arms and hands unimpeded.—Roneo Company, 112-119 Leonard street, New York, N. Y.

Factory Chair

ACID-RESISTING FANS

The problem of handling acid and other corrosive fumes has been met by the employment of rubber-lined blowers with rubber-covered fans or wheels. Hard rubber is used which provides uniform density and adhesion to the metal and has the advantage that it can be applied to practically any size or shape of pipe or duct, or to all parts in contact with the fumes.

Sirocco Rubber-Covered Fan

The illustration shows a "Sirocco" acid-resisting fan of this rubber-covered type. The rubber coating will withstand 175 degrees F., and wheels of diameters up to six feet can be rubber-coated.—American Blower Co., Detroit, Michigan.

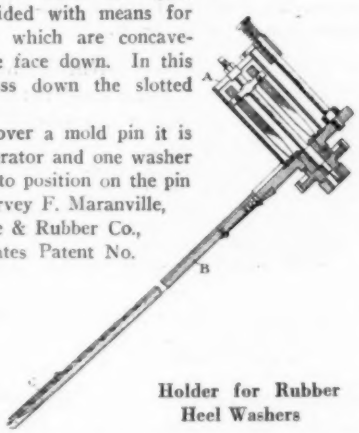
REPLETE WITH INFORMATION FOR RUBBER MANUFACTURERS—H. C. Pearson's "Crude Rubber and Compounding Ingredients," also "Rubber Machinery."

MACHINERY PATENTS

Device for Applying Rubber Heel Washers

This is a tool or holder for carrying a supply of washers, which may be passed over a rubber heel mold, permitting the washers to escape one at a time for forcing onto the shoulders of the mold pins. Compartment A holds the supply of washers and is provided with means for positioning the washers, which are concave-convex, with the concave face down. In this position the washers pass down the slotted runway B.

As the tool is drawn over a mold pin it is raised slightly by the operator and one washer emerges and is pressed into position on the pin by the flat spring C.—Harvey F. Maranville, assignor to Firestone Tire & Rubber Co., Akron, Ohio. United States Patent No. 1,385,086.

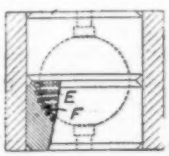


Holder for Rubber Heel Washers

Machine for Lasting Rubber Footwear

A somewhat intricate mechanism has been patented, adapted for lasting rubber-soled shoes uniformly and with more intimate and continuous union than is obtained by hand. The result is accomplished by the action of a series of wiping disks rotating against the upper and turning it over into smooth contact with the adhesive inner sole.—Louis A. Casgrain, Beverly, Massachusetts, assignor to United Shoe Machinery Corporation, Paterson, New Jersey. United States patent No. 1,387,763.

Golf-Ball Mold



Dimpled Mold

The dimpled or brambled formation of a golf-ball cover is obtained by forming holes *E* in the interior surface of the mold, which is then ground true and hardened, and the holes are filled with plugs *F*, the outer ends of which are given the required shape before or after insertion.—J. Boneham, Mansfield, Nottinghamshire, England. British patent No. 166,618.

New Cord Tire Construction

A method of construction for a cord tire has been patented in which all cord tires have a four-ply construction. The cords are of increased size as the tire size increases to conform with the strength required. There is thus an economy of rubber effected by saving two or more coatings of rubber needed between the extra plies in the common tire where six or eight plies of fabric are used.

The method of construction is as follows:

A piece of cord fabric is made wide and long enough to compose the entire fabric portion of the tire, the cords running at an angle of 45 degrees to either end of the piece when that is formed into a band. This band or cylinder is wound into a roll which forms a ring, then the outer edge of the ring is started on the forming core at the bead line and the roll is passed back and forth over and around the core, each pass forming a layer of cords or ply of fabric, and at each turn back in the operation a bead core is placed on the outer face of fabric which passes around the bead, thus enclosing the bead inside the loop of cords. As the bead is inside the loop of fabric it is held with great security.—Floyd W. Russell, Akron, Ohio. United States patent No. 1,393,644.

OTHER MACHINERY PATENTS

The United States

1,395,309 Tire-dressing wheel. P. E. and S. M. Taber, Berkeley, Calif. R. Taber, administratrix of S. M. Taber, deceased.
1,395,410 Apparatus and method for marking rubber strips. R. P. Hassler, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.
1,395,434 Tire-core stripping machine. C. Kuentzel, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.
1,395,944 Tire-vulcanizing mold. W. A. Brubaker, Akron, O.
1,396,068 Vulcanizer igniter. H. A. Sheetz, Jr., New York, N. Y.
1,396,069 Repair vulcanizer. H. A. Sheetz, Jr., New York, N. Y.
1,396,138 Mixing machine for treating rubber compound or other plastic materials. C. C. Mosher, Lima, O.
1,396,145 Mandrel for making inner tubes. F. M. Roessing, Sharpsburg, Pa.
1,396,217 Vulcanizer for tire making and repairing. W. M. Jones, Jr., Rochester, N. Y.
1,396,293 Three-piece tire mold. G. A. Sitzler, assignor to Dutho Rubber Co.—both of Spokane, Wash.
1,396,707 Pneumatic-tire removing apparatus. H. A. Miller, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.
1,397,073 Collapsible core for tires. J. N. Boyce, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.
1,397,087 Rubber forcing machine. E. E. Davidson, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.
1,397,133 Machine for making pneumatic tire covers or casings. C. Macbeth and F. Fellowes, Birmingham, assignors to The Dunlop Rubber Co., Limited, Westminster, London—both in England.
1,397,154 Tire-making machine. R. S. Trogner, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.
1,397,447 Vulcanizing mold for cushion tire fillers. E. F. Nelson, Chicago, Ill., assignor to A. A. Weiss Co., St. Louis, Mo.
1,398,073 Portable duplex tire mold. H. R. Gilson, New Rochelle, N. Y., assignor to The Hartford Rubber Works Co., Hartford, Conn.
1,398,123 Machine for cutting sections from tire casings. J. W. Brundage, assignor to The Miller Rubber Co.—both of Akron, O.
1,398,749 Apparatus and method for manufacturing tires. W. C. Stevens, assignor to Firestone Tire & Rubber Co.—both of Akron, O.
1,398,765 Rubber mixing machine. D. R. Bowen and C. F. Schnuck, assignors to Farrel Foundry & Machine Co.—all of Ansonia, Conn.

The United Kingdom

169,223 Apparatus for treating cords, threads, etc., with rubber solution. S. W. Wardwell, 493 Public street, Providence, Rhode Island, U. S. A.
169,525 Apparatus for stripping tires. T. Sloper, Southgate, Devizes, Wiltshire.

Germany

Patents Issued With Dates of Issue

345,406 (April 30, 1918) Trace press for rubber and similar material. W. T. Glover & Co., Limited, Manchester, England; represented by R. Schmehlink and E. Satlow, Berlin S. W. 61.
345,842 (December 21, 1920) Mechanism for use for rubber treads. Hermann Eggert, Am alten Petritore 9, Braunschweig.
346,265 (February 18, 1920) Comb-cutting machine. Hans Obrist, Olten, Switzerland; represented by O. Sack, Leipzig.

Design Patents Issued With Dates of Issue

797,176 (October 12, 1921) Portable vulcanizing apparatus. Erich Hamann, Tauchaerstrasse 4, Leipzig.
797,283 (October 13, 1921) Nail catcher for rubber tires. Max Bobist, Paulinenstrasse 20, Breslau.
797,284 (October 13, 1921) Nail catcher for rubber tires. Max Bobist, Paulinenstrasse 20, Breslau.

PROCESS PATENTS

The United States

1,397,842 Method of making tire casing fillers. F. M. Netzel, assignor to Velvet Rubber Co.—both of Chicago, Ill.

The United Kingdom

169,334 Repairing cut or burst pneumatic tire casings. S. C. Caddy, 205 Richmond Road, Kingston-on-Thames.

FINGERS AS PLAYERS IN EXCITING FOOTBALL GAME

Football, with all the excitement of participating in the game without the din of cheering crowds, can be had on the dining-room table, with not even the danger of a broken finger nail. The miniature football is formed of hollow rubber. The game is played with the fingers, attached to which are legless cardboard figures typifying football players. The fingers are protected by rubber finger stalls, hoof-shaped at the bottom and fitting the finger to the first joint. Goals of wire and webbing and boundary strings are secured to the table by means of wire clips. The game is very fascinating and realistic.—British Patent No. 148,048. W. C. S. D. Ford, 278 Upland Road, East Dulwich, London, England.

Activities of The Rubber Association of America

Annual Meeting

THE seventh annual meeting of The Rubber Association of America will be held in the Astor gallery of the Waldorf-Astoria, New York, N. Y., January 9, 1922, at 2.30 p. m.

Annual Dinner

The twenty-second annual dinner of The Rubber Association of America will be held in the grand ballroom of the Waldorf-Astoria, New York, N. Y., on the evening of January 9, 1922, at 7.00 p. m.

Members and their friends are cordially invited. The seating will be at round tables accommodating ten persons. Reservations for an entire table or requests for seating with certain individuals must be sent to the office of the Association, 52 Vanderbilt avenue, New York, not later than the evening of January 4. The price of tickets will be ten dollars.

Annual Meetings of Divisions and Committees

Monday, January 9, 1922

Traffic Committee
Yale Club.....10.30 a. m.
Rubber Heel Club of America
Yale Club.....10.30 a. m.
Rubber Reclaimers' Division
Yale Club.....11.00 a. m.
Executive Committee—Tire Manufacturers' Division
Yale Club.....11.00 a. m.
Mechanical Goods Division
Yale Club.....12.00 m.
Foreign Trade Division
Yale Club.....12.00 m.
Hard Rubber Division
Yale Club.....12.00 m.
Footwear Division
Union League Club.....1.00 p. m.
Board of Directors (Organization Meeting)
Waldorf-Astoria .....4.00 p. m.

Tuesday, January 10, 1922

Executive Committee—Tire Manufacturers' Division
Yale Club.....11.00 a. m.
Cycle Tire Manufacturers' Committee
Yale Club.....11.00 a. m.
Accounting Committee
Rubber Association Offices.....11.00 a. m.
Rubber Clothing Division
Yale Club.....11.00 a. m.
Executive Committee—Rubber Sundries Division
Yale Club.....12.00 m.
Rubber Sundries Division
Yale Club.....1.00 p. m.
Rubber Proofers' Division
Yale Club.....1.00 p. m.
Tire Manufacturers' Division
Yale Club.....1.00 p. m.

Luncheon will be served in connection with the above meetings and reservations should be sent promptly to the Association office. The meetings at the Yale Club, 50 Vanderbilt avenue, will be held in rooms on the 18th floor.

The Executive Committee Meeting

The Executive Committee of the Tire Manufacturers' Division met on December 7 in the Association rooms and the revision of tire mileage adjustment was the principal subject discussed. It was proposed to distribute 75,000 educational placards to tire dealers, authorizing the salient features of the new plan. This has been duly authorized by the Board of Directors.

Seneca G. Lewis, chairman of the Division, gave an informal dinner to the members of the Executive Committee at the Ritz-Carlton Hotel, New York, N. Y., on the evening of December 7. The event was commemorated by an artistic folder, the outside showing the various tire trade-marks of the companies represented, while portraits and brief humorous sketches of the members were on the inside.

New Firm Members

The following companies were elected to firm membership, the name of the firm representative being indicated in each instance:

Seiberling Rubber Co.,
41 Milk street, Akron, Ohio.
Frank A. Seiberling.

Pocono Rubber Cloth Co.,
Trenton, New Jersey.
Neil E. Bowman.

Hydro-United Tire Co.,
284 Hanover street, Pottstown, Pennsylvania.
C. A. O'Neill.

The Cooper Corporation,
Findlay, Ohio.
J. F. Schaefer.

British Malaysian Manufacturing Co., Ltd.,
2 Rector street, New York.
W. M. Mullen.

John D. Lewis,
2 Clifford street, New York, N. Y.
Ernest F. Croeniger.

Recommendations of the Rubber Proofers' Division

Recommended Standard Contract Conditions for Proofers of Automobile Fabrics

Cash Discount Terms

Two per cent ten days, net 30 days. (It is recognized, however, that under some conditions, monthly terms are desirable and in this connection it is recommended that the maximum terms be 2 per cent—15th proximo.)

Payments

If buyer fails to pay at a due date any invoice under this or any other sales contract between these parties, seller may at his option cancel or continue to perform this entire contract or any portion thereof, or may postpone delivery until all past due invoices are paid.

Guarantee

The material covered by this contract is guaranteed only against manufacturing defects.

Definite evidence satisfactory to the manufacturer shall be furnished in connection with any alleged manufacturing defect in the quality of the material.

The manufacturer will not assume responsibility for normal deterioration from wear or for injury resulting from age, accident, or abuse.

The manufacturer shall have the privilege of replacing all defective goods returned with the same yardage of perfect material at the original contract price.

In accordance with the general practice throughout the fabric trade, claims for adjustment based upon visible defects in material must be filed within thirty days of receipt of goods by purchaser. No claims will be considered where goods have been marked with chalk, or defaced, or their original condition altered.

Material will be guaranteed against deterioration within twelve months provided it is used for the purpose intended.

Strikes and Casualty

The phraseology of the "Strikes and Casualty" clause is to be prepared by each proofer, individually.

Recommended Rules for Inspection of Rubberized Automobile Fabrics

Length of Roll

Rolls shall contain 60 yards wherever possible, as this is the length which the trade prefers. Rolls may vary, however, from 50 yards to 70 yards in length.

Number of Pieces in Roll

Rolls shall not contain more than three pieces and no piece shall be less than 6 yards in length. It is understood that one piece per roll is preferred.

Width

All material shall measure full width as specified.

Weight

The allowable variation in weight per linear year on 54-inch

goods shall be 1 ounce under or 2 ounces over the weight specified; for other widths the allowable variations shall be in proportion.

Grain Finish—Color of Back

The grain, the lustre of the finish, and the color of the dyed backing shall show only slight variations. There shall, however, be no variations in the different pieces in each roll. The allowable variations shall be within the limits of the seller's samples.

Seams

All seams shall be cut out with the exception of the seams which occur in the lining of double texture material in which case allowance is made, but this allowance shall be at least 6 yards from the end of the piece.

Allowances

No roll shall have over three allowances, which shall be at least 6 yards apart and 6 yards from the end of the piece. Defects which have affected the waterproof quality of the goods shall be cut out and shall not be allowed for. Allowances shall cover such defects as varnish skips, varnish daubs, large collections of lint, seams in double texture lining, large unsightly threads, small stains on the backing, etc.

Trimming

The edges of double texture goods need not be trimmed provided one edge is even.

Identification

The manufacturer shall punch or stamp each end of each piece with some characteristic design decided upon by him. This is to serve as a protection against unjust claims for shortage.

Recommended Standard Shrinkage Allowances on Rubberized Automobile Fabrics

Resolution

(September 14, 1921)

Whereas, The Automobile Fabric Manufacturers' Section of the Rubber Proofers' Division is of the opinion that, for the mutual protection of the customer and proofer, adequate shrinkage allowances on goods furnished by customers for calendering should be specified, the Automobile Fabric Manufacurers' Section does hereby

Recommend—that good deliveries in this class of business on single and double texture calendered materials shall be understood as follows:

On single texture calendered goods, a good delivery shall constitute 97½ per cent of the amount of cloth furnished by customer, of which 95 per cent (of the whole) shall be the first quality, and 2½ per cent (of the whole) may be seconds or short lengths.

On double texture calendered goods, a good delivery shall constitute 96¼ per cent of the amount of cloth furnished by customer, of which 92½ per cent (of the whole) shall be of first quality, and 3¼ per cent (of the whole) may be seconds or short lengths.

THE PURE GUM UNVULCANIZED SOLE

It goes without saying that the suggestion that shoes could be better shod with unvulcanized sheet than with molded soles, should attract instant attention. And as there are hundreds of tons of unvulcanized sheet available in the United States, such shoe soles were at once cut and put into service. The illustration shows the first and perhaps the only sole of that type ever made in the United States.

Beginning at the beginning, the repair men were disgusted with the product. It was difficult to sew through, would not hold

Sole of Unvulcanized Smoked Sheet Rubber

nails or pegs, and did not lie smoothly. As to making a workmanlike edge finish, that was an impossibility. As a rule, therefore, the repair man charged more for applying a pair of such soles, even though the rubber was given him, than for putting on molded soles and supplying the materials himself.

The wearer, barring the finish of the shoe, was usually delighted; that is, at first. The soles were light, springy, and gave a wonderful foot grip. After a little while, however, the unvulcanized rubber began to creep and spread out at the edges where dust and dirt gathered. These edges, under the influence of slight heat, became decidedly sticky. Furthermore, in wear, the soles showed a tendency to cut and tear whenever they were used for rough climbing.

The consensus of opinion, therefore, was that the vulcanized sole was not threatened by the unvulcanized article.

STEEL-STUDDED TIRES FOR LONDON VEHICLES

According to press reports all motor vehicles plying for hire in London, England, must be equipped with at least two steel-studded tires. This regulation is designed to promote greater safety.

Report of Inventory—Production—Domestic Shipments of Pneumatic Casings—Inner Tubes—Solid Tires, Etc.

NOVEMBER, 1920, TO AND INCLUDING OCTOBER, 1921

MONTH	PNEUMATIC CASINGS				INNER TUBES				SOLID TIRES			
	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments
November, 1920	36	5,880,016	649,742	806,073	40	6,131,935	742,815	920,938	11	298,875	21,355	34,217
December, 1920	43	5,508,380	506,111	1,327,153	43	5,786,929	508,446	1,481,285	12	303,473	16,297	40,828
January, 1921	45	5,319,605	703,430	965,417	47	5,586,163	740,824	1,042,617	12	303,753	21,220	29,116
February, 1921	45	5,193,018	819,892	1,073,755	46	5,415,464	916,627	1,129,881	12	301,374	23,365	29,599
March, 1921	46	4,597,103	1,163,314	1,614,651	48	5,044,861	1,346,483	1,643,690	12	283,800	28,710	43,926
April, 1921	49	4,527,445	1,651,418	1,785,951	51	4,916,772	1,762,122	1,983,571	12	269,985	28,859	42,080
May, 1921	59	4,451,668	2,100,917	2,085,882	57	4,751,880	2,210,040	2,342,567	12	264,633	35,156	40,122
June, 1921	63	4,154,456	2,313,265	2,643,850	60	3,835,098	2,359,928	3,232,673	11	240,336	28,395	49,867
July, 1921	63	3,892,037	2,570,524	2,757,581	61	3,122,815	3,020,981	3,603,248	11	220,003	35,123	55,678
August, 1921	66	3,934,853	3,043,187	2,894,442	64	3,649,319	4,430,152	3,804,060	11	216,367	55,694	66,856
September, 1921	63	3,340,798	1,929,268	2,047,929	62	3,827,830	3,274,822	2,645,758	11	161,832	37,741	50,276
October, 1921	64	3,545,030	1,928,271	1,675,169	64	4,732,016	2,843,918	2,016,371	10	163,299	46,274	45,911

Compiled by The Rubber Association of America, Inc.

"Production" and "Shipment" figures cover the entire month for which each report is made. "Inventory" is reported as of the last day of each month.

"Inventory" includes tires and tubes constituting domestic stock in factory and in transit to, or at, warehouses, branches (if any), or in possession of dealers on consignment basis, and as a total represents all tires and tubes still owned by manufacturers as a domestic stock.

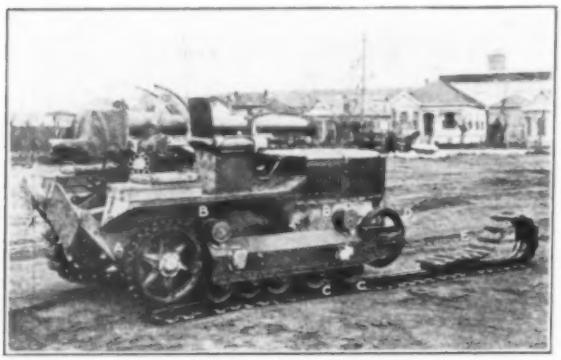
"Shipments" includes only stock forwarded to a *purchaser* and does not include stock forwarded to a warehouse, branch, or on a consignment basis, or abroad.

The table above shows the monthly record of tire production, shipments and inventory for a full year, beginning November, 1920, and ending October, 1921. This is the first time in the history of the industry that such complete and detail information has been available.

CATERPILLAR GUN MOUNTS UTILIZE RUBBER

The utilization of rubber in the manufacture of tractors appears to have resulted in success and is exemplified in the "caterpillar" gun mounts, recently designed and built for the United States Government by Pliny Holt, of the Holt Manufacturing Co., Stockton, California.

The caterpillar track, shown in the illustration, has two steel rails with the rubber shoes resting on the ground under the joint between the links of the track. The track is picked up with the rear



The Holt Caterpillar Gun Mount

A—Rubber Tires on Face of Drive-Sprockets. B—Rubber Tires on Face of Track-Supporting Rollers. C—Rubber Tires on Front Truck Wheels. D—Rubber Tires on Front Idler. E—Rubber Pads on Truck Shoes.

of the machine, carried forward and laid down again in front. The shock of lifting it from the ground is cushioned by the rubber tires on the drive-sprockets. The track is carried forward over the rubber-tired track-supporting rollers, which are therefore noiseless. It then runs down over the rubber-tired front idler, thus being laid firmly on the ground by the rubber-tired front truck wheels.

The rubber on all these steel parts has been vulcanized to the rims. A layer of hard rubber is placed on the steel and then resilient rubber on top of the hard rubber. Thus a chemical bond is obtained between the steel and the hard rubber and also between the hard rubber and tire rubber, so that secure fastening is assured.

The use of rubber for track shoes, front idlers, track-supporting rollers, front truck wheels, and drive-sprockets has the following advantages: greater speed is made possible; excessive noise and vibration eliminated; rubber has been found to have astonishing durability, one of these Holt tractors having traveled nearly a thousand miles with a negligible amount of wear on the rubber; tractors of this character can be run on highways without marking the surface.

The advantages of such equipments, and the possibilities suggested by the use of rubber in caterpillar tractors are self-evident.

PRACTICAL FACTORY ROUTING

In old established factories many instances occur of congestion and circuitous routing of materials and goods in process. These conditions exist frequently because of more or less haphazard extensions of factory buildings, and to lack of thought on the part of foremen who fail to consider the cost of labor for unnecessary handling.

An instance of this sort recently observed was that of a hand-trucking detour of several hundred feet around a factory engine room which was obviated by converting two windows into doors and arranging a straight run of 75 feet past the engine room outside the building.

Similarly in long workrooms the foreman's office should be centered at one side rather than at either end of the room. In a press room arrangement where the presses are placed around three sides of the room the vacant center space in the room should be utilized for trimming and inspection, thus saving one handling of the product.

TIROMETER VALVES ON TUBES REGULATE TIRE INFLATION

In the production of Tirometer tubes and valves the manufacturing company claims to do away with guesswork in the matter of tire inflation, and insures, by the new invention, the maximum mileage a tire should give. Tirometer tubes, red or grey, are made of pure gum, and are of extra heavy gage, while the valve, a combination valve and gage, shows at all times the exact air pressure. These tubes and valves can be used in regular casings and wheels without alteration, while their installation is guaranteed to furnish one-third more mileage for the tire. Illustrations and additional description of these accessories were given in THE INDIA RUBBER WORLD, April 1, 1920, and March 1, 1921.—Tirometer Valve Corporation of America, Charleston, West Virginia.

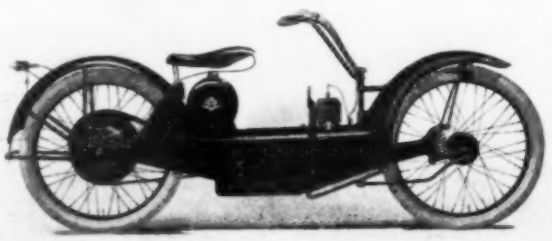
THE RUBBER SERVICE LABORATORIES CO.

The Rubber Service Laboratories Co., R. C. Hartong, president; C. W. Bedford and C. N. Hand, vice-presidents, and C. O. North, secretary and treasurer, has recently been incorporated to engage in the manufacture of rubber vulcanization accelerators and other materials. In connection with their products they will furnish free consulting service to their patrons.

The laboratory of the company is at Akron, Ohio, and its chemical plant at Nitro, West Virginia. The staff of the company includes well-known rubber chemists and manufacturing experts formerly comprised in the research organization of The Goodyear Tire & Rubber Co. and will function as auxiliary departments to supplement the existing staff of their clients or to furnish such service to small rubber companies who do not maintain development departments.

"NER-A-CAR" REPRESENTS PRACTICAL VEHICLE

A convenient little two-wheeled vehicle, suitable for many occasions where a large car is unnecessary, is claimed to have many of the features of the ordinary automobile. Its frame, chassis, method of spring suspension, and quiet operation all suggest a motor car, while the low lines of the new vehicle, and center of gravity below the hubs of the wheels give the rider a sense



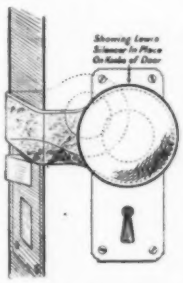
The "Ner-A-Car" Motorcycle

of security. As all mechanism is beneath the hood the rider is not exposed to dirt or grease, while the broad front fender is a protection from wind and dust. The 26 by 3-inch penumatic tires add to the comfort in riding, and are much oversize for a vehicle of the "Ner-A-Car" weight, approximately 165 pounds. The manufacturer claims that it travels 85 to 100 miles per gallon of gas, and that it is most satisfactory in the matter of economy.—Ner-A-Car Corporation, 196 South Geddes street, Syracuse, New York.

New Goods and Specialties

Slamming Door Nuisance Eliminated

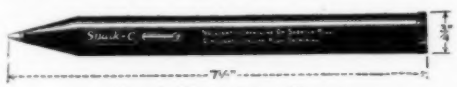
DRUGGISTS and dealers in hospital supplies should know about a useful invention, especially appreciated in hospitals or sick-rooms. It is a rubber "silencer," made simply of a small strip of rubber, with a loop at each end. By slipping these loops over the knobs of a door all slamming of the latter is done away with and rattling deadened. As the rubber responds to any desired degree of contraction the silencer will fit any door and the door can be either entirely closed, or left partially open. These door stops can be furnished in quantities of a hundred or more.—Pennsylvania Rubber Co. of America, Jeannette, Pennsylvania; eastern agent, William A. Atkinson, 249 Eighth street, Jersey City, New Jersey.



Lewis Silencer

Tester to Locate Ignition Trouble

Among the new automobile accessories is the "Spark-C" ignition tester, with hard rubber barrel provided with a "window" through which flashes of light appear when the tester is applied to the ignition system of a gasoline engine. The intensity or brightness of the flashes indicates the nature of any trouble.



"Spark-C" Ignition Tester

"Spark-C" is recommended for any internal combustion engine using electric ignition and is useful in service stations, garages, car sales room, and automobile factories, as well as to individuals owning cars or operating wireless, X-ray apparatus, etc.—Westinghouse Lamp Co., 165 Broadway, New York, N. Y.

Rubber in Hotel Conveniences

A practical and sanitary maid service wagon for hotels is equipped with rubber tires and has a rubber bumper all the way around at the bottom to prevent marring or scratching of woodwork. The frame is of braced steel. There is a covered cabinet at the top for glasses, soap, stationery, and other room accessories, while below are 3-ply veneered shelves for linens, with sanitary wire mesh between at the back and ends. Two heavy canvas bags, one for soiled linen and the other for waste paper, are attached over the rounded framework at the ends by means of snap fastenings, on which feature a patent has been applied for. Below the waste paper bag is a dropped shelf with a rail to hold water pails, mops, etc. The wheels are roller-bearing and rubber-tired and are entirely underneath the wagon so that a larger body can be used.—Jarvis & Jarvis, Palmer, Massachusetts.

Model "B" Maid Service Wagon

Rubber Foothold on Skis for Winter Sports

Winter sports in northern climates are not complete without a pair of skis, and the well-made ones now have a rubber foothold in the center, beneath the straps. The material used resembles rubber matting and has either a corrugated surface or a non-skid design to guard against the foot slipping. The ski itself is made of high-grade wood, well-shaped, finished and polished.—Northland Ski Manufacturing Co., 2306 Hampden avenue, St. Paul, Minnesota.

Ski with Rubber Foothold

Practice Golf Ball

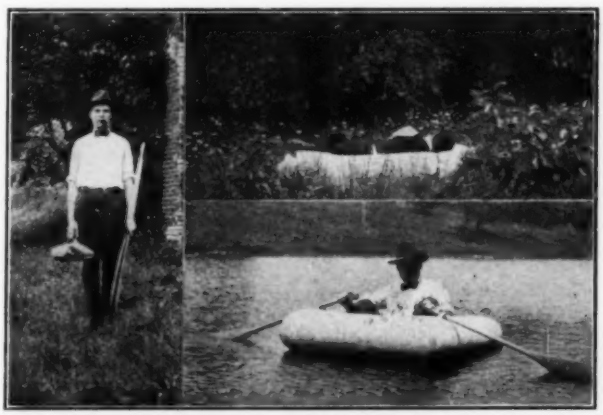
Among the new devices for the practice of golf in limited space is the Turner practice golf ball, which is practically only a hollow rubber ball with tee attached to raise it to the regulation height. It was first intended for use in practising the correct swing of the driver and brassie, but it also supplements the work of the professional in illustrating to pupils the stance, poise and swing of the club.

The Turner practice golf ball can be used in the small yard, or even in the house. Being of rubber, it will not mar objects.—Paul Turner, patentee, 4475 Cass avenue, Detroit, Michigan.

Turner Practice Golf Ball

Portable Boat or Bed, as You Like

The "Padaboat" is made of specially rubberized fabric. It is composed of four air chambers, each separate from the others, attached at the bottom edges to a central piece of the fabric, and inflated by means of a rubber tube which is a part of each chamber. After inflation the tube is closed by doubling over and tying, there being no valve to get out of order. When deflated the "Padaboat" can be folded and wrapped up in its own khaki cover secured to the upper side of the bottom of the boat. When desired for use as a bed, the "Padaboat" is inverted, the air chambers becoming cushions. This convenience for sportsmen fond of the open is made to carry either one or two persons. It is protected by United States patent No. 1,392,533.—The Connecticut Aircraft Co., assignee of Charles F. Smyth, both of New Haven, Connecticut.



Smyth "Padaboat"

Toy from a Rubber Glove

The development of toy manufacture in the United States has been the means of stimulating designers to produce new and unusual novelties, among which are many rubber ones.

Unique Inflated Toy

The unique inflated toy shown here is made from an ordinary household rubber glove provided with a removable metal base on which it will stand up. The base is perforated and has cemented on the inside a tiny piece of sheet rubber loose at one side, to serve as an inflating valve. Around the thumb of the glove is stamped or printed the features of a clown's face, reckoning the thumb as the nose. When this toy is inflated it becomes something funny as well as unique. The inventor of this novelty has applied for a patent on it.—J. O. Karpen, 222 Grand avenue, Nutley, New Jersey.

"Adirondack" Tire Tubes

Tire tubes, which cost no more than other high-grade makes, which are spliceless and seamless and of flat circular shape, with valve molded into the tube, are being offered, as distributers, by the Adirondack Tire Tube Co., 780 Worthington street, Springfield, Massachusetts. These tubes are produced in sizes ranging from 30 by 3½ to 36 by 6, and are guaranteed to be free from defects in material or workmanship under normal use and service.—North American Process Co., Malone, N. Y.

Rubber-Lined Bathing Shoe

Dealers in bathing costumes and beach novelties will welcome again the coming season the "Marvel" bathing shoe, one of the members of the "Water Lily" brand line of bathing accessories.

"Marvel" Bathing Shoe

Because of its snug appearance, women always prefer a shoe that laces, but in a bathing shoe a lace is sometimes looked upon as a bother. The "Marvel" bathing shoe meets both this preference and the occasional objection to it by providing a shoe that laces for appearance but that has a patent sliding fastener at the back for real service. The lacing need not be untied after it is once laced to fit the foot, as the fastener is instantly slid from the top to the bottom, permitting the foot to be withdrawn even more conveniently than from the ordinary shoe. The material of which this shoe is made is a high grade of sateen in bright colors, backed with rubberized duck.—E. A. Guinzburg, 69 Fifth avenue, New York, N. Y.

Pictured Rubberized Apron for Children

The rubberized apron illustrated here is a real apron and not a bib. It is for children of eight or older and will appeal to parents because of its practicality and to the children because of its interesting decorations; therefore it should be a profitable item for manufacturers and dealers. This apron is backed with good-quality rubber coating in gray, while the outside is decorated with colored pictures on pink, blue, or brown fabric. "Peter Piper" and "The Balloon Man" are among the different stories illustrated, while the one shown here represents toys and children at play. The edge of the apron and its convenient pocket are bound with tape of contrasting color, and the apron buttons around the neck and ties under the arms.—Empire Shield Co., 818 Broadway, New York, N. Y.

Rubberized Play Apron

Wide-Tread Non-Skid Cord

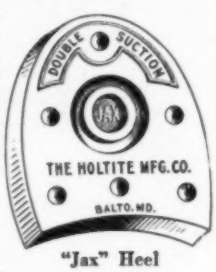
"Union Heart Release Suction Cord"

The prevalence of automobile accidents due to skidding has led tire manufacturers to produce tires so designed that they will grip the road surface. Some form of the vacuum-cup tread is an aid in this direction, and a wide, flat tread surface offers additional advantage.

The "Union Heart Release Suction Cord" illustrated here combines an efficient non-skid feature with release suction by means of a hollow heart tread design. These tires are custom hand-made on collapsible cores, to minimize the strain on the cords in removing the core after vulcanization. The manufacturer claims that these tires are ten per cent larger than the average popular tire intended for the same use and guarantees them free from imperfections in workmanship and material. They are also made for motorcycles as well as for automobiles.—Union Special Rubber Co., 1834 Broadway, New York, N. Y.; 112 North La Salle street, Chicago, Illinois.

Heel with Double Suction-Cup Feature

A new rubber heel recently put on the market by a southern manufacturer has a double suction-cup feature which is provided as the non-skid element. These heels, known as the "Jax," are made of new live rubber and are so shaped that they require no cementing and make a tight edge. The "Jax" heels come in both whole and half-heels of regulation shape for men and women, in black, tan, and white, and in kidney and French shapes for women's shoes.



"Jax" Heel

The same manufacturer also makes the "Stanswear" whole heel for men's shoes, as well as a line of rubber soles.—The Holtite Manufacturing Co., Inc., 919 East Baltimore street, Baltimore, Maryland.

Balata Put to New Use

The surprising thing, to those who are familiar with the characteristics of balata, is that it is not more generally used instead of rubber in practical devices.

The cover illustrated here for an automobile pedal is made of canvas impregnated with balata, cut in two pieces, stitched together, and bound at the edges, and is intended to be slipped on over the regular metal pedal. This covering, due to the great non-skid quality of balata, makes a non-slip surface for the foot to rest upon.—British Patent No. 166,849. J. Hart, 16 Walter street, Dennistoun, Glasgow.

Balata Pedal Cover

Heel in Line with Sole

With the idea of keeping the bottom lift of the heel in line with the sole of a shoe, the manufacturers of the "Twin Star Wedge" heel developed a design for a rubber heel that is thicker at the back than at the front. This, the manufacturer claims, preserves the walking line of the shoe.—Wedge Heel & Rubber Co., Inc., Fort Wayne, Indiana.

"Wedge" Heel

"Gold Edge" Transmission Lining for Fords

The manufacturer of "Raybestos" products has recently put on the market a new brand of transmission lining for Ford cars, to be known as "Gold Edge," the edges being painted gold color. There is a different type for each band, properly numbered and labeled "Reverse," "Slow Speed," and "Brake," and the three come put up in an attractive package.—The Raybestos Co., Bridgeport, Connecticut; The Canadian Raybestos Co., Limited, Peterborough, Ontario, Canada.

Sponge Rubber Toys in England

"Sorbo" rubber-sponge material was used during the war in British gas masks; as shock absorbers for aircraft taking war photographs; in submarine listening and aerial wireless apparatus; in transporting fragile electric bulbs for scientific apparatus used by the War Office; in producing an absolutely non-leakable petrol tank for aircraft; and in wireless and intercommunicating telephone sets like those on the R-33 on her transatlantic trip.

Unburstable Ball

This material is now being produced to factory capacity under the Leeson patents on a 24-hour-day schedule, and much of it is being diverted to the development of toys.

Three illustrated show the "Sorbo Bouncer Unburstable Ball," and two of the colored floating toys, a duck and a fish. The colors are harmless and the "Sorbo Bouncer" is so resilient, its manufacturer claims, that a knife may be plunged into it without affecting the resiliency. There is also manufactured the "Sorbo Junior Unburstable Ball," less durable, but

"Sorbo" Duck

"Sorbo" Fish

very resilient and quite unburstable, made to sell at the popular price of one shilling. The floating toys include a seal and a rabbit besides those illustrated here.—Sorbo Rubber-Sponge Products Limited, 24 Walbrook, London, E. C. 4, England.

"Tire-Ite" Preserves Tires or Mats

"Tire-Ite," made in white, light-gray, and, upon request, in black, is applied like paint to preserve spare tires and rubber automobile mats by preventing air from penetrating the rubber. It fills all cracks and pores, giving a smooth, elastic finish.—Adams & Elting Co., 716 Washington Boulevard, Chicago, Illinois.

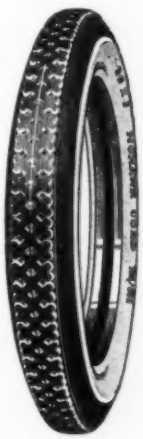
Rubber in Arch Pads

A manufacturer of shoe accessories utilizes sponge rubber in the manufacture of heel, cushions, combined heels and halfsoles, arch supports, and the transversal arch pad illustrated here. The base of all these articles is of leather, to which the molded sponge rubber is applied.—Sponge Rubber Inner Heel Co., 103 Summer street, Paterson, New Jersey.

"Nerv-Ease" Arch Pad

Non-Skid Cord Tire

A new non-skid cord tire has a flat tread with a broad surface that permits the manufacturer to put an extra amount of rubber on the part where the wear comes and yet retain the desired flexibility of the sidewalls. The tread design has, besides, special non-skid features which give it a firm grip on the road and help minimize the danger of skidding. The "Mohawk Cord" is the result of three years' work and, it is claimed, is one of the fastest tires on the market.—The Mohawk Rubber Co., Akron, Ohio.



"Mohawk Cord"

New Application of Famous "Hub Gore A"

By dispensing with all fastenings and inserting guaranteed silk elastic goring, there has been produced what is called the elastic-side sandal pump. A trim fit is assured and an emphasis on the good lines of the foot.

The strapped pump shown here is of black patent leather, but there are other developments in suede, in silver, bronze and gold brocaded fabrics, in satin, and in brown leather like that used for oxfords. In each case an effort is made to use the particular color and quality of silk goring that will best match and harmonize with the material of the shoe to produce a stylish and not a cheap effect. High-tongued colonial pumps of patent leather stitched in colors are among the models.

Elastic-Side Sandal Pump

The manufacturers of these pumps include the Bally Co., Inc., 9 Spruce street, and the Star Shoe Co., 108 Duane street, New York. Evening and street pumps are on display at retail by Alfred A. Kohn, 505 Fifth avenue, New York, N. Y.

The manufacturer of the silk elastic goring for these pumps has several of its looms busy producing it in a number of different colors.—Everlastik, Inc., Chelsea 50, Massachusetts.

JUDICIAL DECISIONS

Treasury Decisions

Protest (T. D. 38921—G. A. 8484) of American Express Co., New York, N. Y.

In the case of artificial silk slivers or tops, claimed by the importers as merchandise properly dutiable at 10 per cent ad valorem as "waste not specifically provided for," the court held that as such merchandise was found to have undergone three separate manufacturing processes it was no longer waste. It was therefore assessed at the rate of 35 per cent ad valorem as "filaments of artificial or imitation silk." Such fibers or filaments and also those made of imitation horsehair and india rubber, when used in the manufacture of beltings, cords, tassels, etc., are assessed 60 per cent ad valorem.—*Treasury Decisions,* Volume 42, page 9.

Protest (T. D. 38906—G. A. 8477) of Goodyear Tire & Rubber Co. of Canada, Limited, Toronto, Canada.

In a question concerning the validity of appraisement and reappraisement of automobile tires, the product of The Goodyear Tire & Rubber Co. of Canada, Limited, the protest was made by the manufacturers that the appraisers were in error in not finding a market value based upon the export price. This protest, however, was not sustained, the court confirming the decisions of the single general appraiser and the board of general appraisers, who had adopted as the dutiable value the prices at which the tires were sold at wholesale to dealers in Canada.—*Treasury Decisions,* Volume 40, No. 20, page 11.

Adjudicated Patents

AKRON-OVERLAND TIRE CO. VS. WILLYS-OVERLAND CO. U. S. Circuit Court of Appeals, Third Circuit.

The recent case of Akron-Overland Tire Co. vs. Willys-Overland Co., appealed from the District Court of the United States for the District of Delaware, was decided in favor of the plaintiff. It was held that the adoption of the word "Overland" by the defendant might be misleading to the public, and that one company might be supposed to be a subsidiary of the other, a supposition which might prove detrimental to the interests of one or both companies. While it was recognized that one company manufactured automobiles while the other retreaded and sold tires, the court found no abuse of discretion on the part of the lower court in the granting of the injunction restraining the Akron-Overland Tire Co. from the use of the word in question.—*Federal Reporter,* Volume 273, page 674.

MUNGER VS. PERLMAN RIM CORPORATION. United States Circuit Court of Appeals, New York. Decided June 1, 1921.

The Munger patent, No. 638,588, for demountable rim for automobile-tires, held valid and infringed.—*Federal Reporter,* Volume 275, page 21.

METALLIC RUBBER TIRE CO. VS. HARTFORD RUBBER WORKS CO. Circuit Court of Appeals, Connecticut.

The claims of The Metallic Rubber Tire Co. that patent No. 609,320, granted to Calvin T. Adams in the year 1898, had been infringed, were finally not sustained, and The Hartford Rubber Works Co. is not held liable for damages, as previously decided. This case has been appealed and reappealed in recent years.—*Federal Reporter,* Volume 189, page 402; Volume 200, page 743; Volume 266, page 543.

INTERESTING LETTERS FROM OUR READERS

Carbonic Acid Gas for Spreader Fires?

TO THE EDITOR:

DEAR SIR: Do you consider carbonic acid gas, such as is supplied in cylinders to soda fountains, suitable for use in the prevention or extinguishing of fires in spreader rooms? It is understood that 20 per cent of carbonic acid must be present in the atmosphere to extinguish fires, and naturally this means that this atmosphere would be impossible to breathe.

Can you suggest any methods whereby the use of this gas for the purposes mentioned would be practicable?

INQUIRER.

The use of carbonic acid gas for the prevention or extinguishing of fires has been frequently suggested, and such gas is commonly prepared for hand extinguishers. Its value in such instances, however, is more in the pressure which it exerts in projecting the water than the incombustible qualities of the gas. When it is considered that the fire itself is producing carbonic acid gas in very large quantities it will be seen that the only advantage which such a gas would have is to lower the temperature, which would be of little importance. The best chemical extinguisher that I know of for volatile solvents in rubber mills is of the foam type.—EXPERT.

Taking the Pneumatic Sole Literally

TO THE EDITOR:

DEAR SIR: I noticed with much interest in the December number of THE INDIA RUBBER WORLD that among other awards made by the Rubber Growers' Association, in the suggestion contest for extensive use of rubber, are some for "pneumatic soles."

I welcome such trade possibilities and congratulate the winners. I begrudge them, however, neither honor nor emolument when suggesting that some award should also be made to the cartoonist—if he is still drawing his breath—who twenty years ago in a German comic weekly so graphically demonstrated the value of just such soles. I am sending the illustration to you in the hope that you may deem it worth reproducing.

St. Louis, Missouri. HERMAN DRESSEL.

Fliegende Blaetter

The Drummer Shows Rubber-Soled Shoes **He Demonstrates Their Springiness** **And Comes Down Smiling**

News of the American Rubber Industry

Financial

Boston Woven Hose & Rubber Co.'s Statement

COMMENTING on the recent statement prepared by the officials of the Boston Woven Hose & Rubber Co., Cambridge, Massachusetts, George E. Hall, president and general manager of the company, said:

"The statement submitted by the assistant treasurer shows the condition of the company at the beginning of business on September 1, 1921. It does not give the volume or result of the company's current business for the fiscal year then ended nor does it show specifically the amount of the company's loss on its inventory appearing in the treasurer's statement as of September 1, 1920, which was presented to the stockholders at the last annual meeting.

"Notwithstanding the great shrinkage in volume from last year, the business of the year, looking at current operations only, and taking the cost of raw materials at market or replacement value from time to time, yielded a larger manufacturing profit than the company earned in any year before the war. The company could have paid its usual dividends and added materially to its surplus out of such profits of the year had it not been for the loss incurred on its inventory of raw materials and finished goods previously accumulated in the rapidly increasing business of the years immediately preceding. This inventory as shown in the last statement to stockholders amounted to $4,925,000 on September 1, 1920.

"Within the first half of the fiscal year which is the subject of this report, this inventory had shrunk in market values by an average of approximately 50 per cent. As nearly as we can now estimate and state that shrinkage, it amounted to substantially $2,300,000. As the stockholders well know, this fall in market values, which was especially drastic in cotton goods and rubber, the principal raw materials used by your company, was the result of a world-wide decline in commodity values unparalleled both in extent and rapidity."

The sales of the past year have been $7,761,495.33 as compared with previous years as follows: 1920, $14,315,891.32; 1919, $9,076,885.36; 1918, $10,125,454.10; 1917, $7,800,803.04; 1916, $6,101,462.15; 1915, $4,750,950.73; 1914, $4,668,804.42; 1913, $4,869,022.22; 1912, $4,418,914.88; 1911, $3,550,839.28.

Mr. Hall considers that the company, judging from the results of its current manufacturing operations, has had a profitable year, as it has held its customers and its business. The manufacturing profit of the year's operations has materially offset the loss on inventory, while $488,000 has been paid out in dividends.

"The credit of the company has been excellent even during the most trying period in banking conditions. Its present statement of assets and liabilities affords assurance of the continuance of the situation in this regard showing as it does quick assets of substantially two to one as compared with the company's indebtedness. The company has written down its inventory to lowest market values. The worst has been fully met. There is no sound reason to question the ability of the company to earn satisfactory profits in the future."

Statement Submitted by the Assistant Treasurer

ASSETS — September 1, 1921			
Patents			$1.00
Office furniture			1.00
Land (assessed value)		$224,100.00	
Buildings	$2,163,845.89		
Less—reserve for depreciation	721,318.91		
		$1,442,526.98	
Machinery and fixtures	$2,490,811.51		
Less—reserve for depreciation	1,169,783.58		
		$1,321,027.93	$2,987,654.91
Employes' notes for stock subscription			$261,422.63
Contract adjustments on undelivered materials			154,780.00
Cash	$589,518.17		
Accounts receivable	923,884.70		
Notes receivable and acceptances	49,916.38		
Equity liberty bonds	105,500.00		
Merchandise inventory	2,438,244.21		$4,107,063.46
			$7,510,923.00
LIABILITIES			
Capital stock—preferred	$750,000.00		
Capital stock—common	4,250,000.00		$5,000,000.00
Accounts payable (not yet due)	$106,265.45		
Accrued wages	24,828.83		
Loans	1,917,500.00		$2,048,594.28
Reserve for contract adjustments	$154,780.00		
Surplus	307,548.72		$462,328.72
			$7,510,923.00

Firestone Balance Sheet

The Firestone Tire & Rubber Co., as shown in its last annual balance sheet, has absorbed its complete inventory losses, amounting to over $16,000,000, and enters the new year with inventory at or below the market and with expenses at their low point.

Sales for the year totaled $66,000,000, which is a decrease of 42 per cent as compared with the total for 1920 of $114,000,000. Decreases were noted in exports, amounting to 41 per cent of the total decrease, and a 22 per cent decrease to automobile manufacturers. While dealers' sales increased two per cent, selling costs decreased 38 per cent.

Inventory was written down to $12,000,000 as compared with $45,000,000 in 1920. Bank loans decreased from $31,000,000 to $21,000,000. Surplus decreased from $33,000,000 to $15,000,000 in the process of absorbing all inventory losses.

President H. S. Firestone expressed himself as very optimistic towards the future. "With inventory clean, with expenses low and with our product better known we enter the year 1922 under the most favorable circumstances," he said.

Comparative balance sheets for the past two years follow:

Comparative Firestone Statements as of October 31

ASSETS	1921	1920
Current Assets		
Cash	$5,888,564	$5,198,059
Notes and accounts receivable	12,181,114	13,034,701
Finished and raw material inventories	12,534,369	45,163,710
Due from employes on stock	5,905,424	6,264,847
House and lot account, Coventry Land and Improvement Co.	3,314,205	3,632,080
Prepaid insurance, taxes, interest,		439,103
Treasury stock 1921 only	129,848	.....
Total current assets (Not totaled for 1921)	.....	$73,732,503
Investment in foreign proprietory company stocks	$3,989,055	3,665,211
Lands, buildings, machinery	30,594,721	29,412,396
Deferred charges	711,269	504,089
Total	$75,248,572	$107,404,200
LIABILITIES		
Current Liabilities		
Notes and acceptances payable	$21,105,000	$31,355,816
Accounts payable	2,368,276	751,919
Accrued salaries, taxes	351,927	756,833
Customers' credit balance	42,838	.....
Total current liabilities (Not totaled for 1921)	.....	$32,684,568
Reserves		
Depreciation, buildings, machinery, etc	$9,041,715	$8,098,495
Insurance (For liquidation of inventory, 1921)	1,688,887	838,629
(For general contingencies)	700,000	$8,937,124
Provisions out of current year's earnings		
For inventory losses	.....	$8,151,749
Preferred 6 per cent stock	$10,000,000	10,000,000
Preferred 7 per cent stock	10,000,000	10,000,000
Common stock	3,561,670	3,750,000
Surplus	15,813,258	33,880,757
Totals	$75,248,572	$107,404,200
Sales	66,372,938	114,980,969
Earnings	.....	9,396,912

Sales in 1920 were $23,902,455 over those of 1919.

Hood Rubber Co.'s New Financing

The $6,000,000 Hood Rubber Co. fifteen-year 7 per cent sinking fund gold notes recently offered by a syndicate at 97½ and interest to yield 7.25 per cent, were oversubscribed. The notes constitute the sole funded debt of the company, which has net quick assets, estimated at $11,300,000 after giving effect to the proceeds of the notes, and of an issue of 10,000 shares of common stock which is being made at this time. The company will retire by redemption or purchase at least $200,000 par value of the notes on or before December 1, 1926, and at least $200,000 additional before each succeeding December 1 up to 1935.

Ajax Rubber Financing Completed

The Ajax Rubber Co., Inc., has sold to a New York syndicate $3,000,000 first mortgage 8 per cent 15-year bonds, which will be offered for subscription. It is further stated that the syndicate has underwritten a new issue of 200,000 shares of additional stock of the same corporation which will be offered to stockholders for subscription.

For the nine months ended September 30 last, the company sustained a loss, after interest charges, of $3,966,455. This included inventory depreciation, operating losses and reserves. Net sales for the period were $8,037,382, compared with $17,031,121 for the full year 1920.

Dividends Declared

COMPANIES	STOCK RATE	PAYABLE	STOCK OF RECORD
Allis-Chalmers Mfg. Co.	Pfd. $1.75 q.	Jan. 16	Dec. 24
Ault & Wiborg	Com. 1¾% q.	Jan. 2	Dec. 17
Boston Woven Hose & Rubber Co.	Com. 1½% q.	Dec. 15	Dec. 1
Boston Woven Hose & Rubber Co.	Pfd. 3% s.a.	Dec. 15	Dec. 1
du Pont de Nemours, E. I., & Co.	Com. 2% q.	Dec. 15	Dec. 5
du Pont de Nemours, E. I., & Co.	Deb. 1½% q.	Jan. 25	Jan. 10
Fire-stone-Apsley Rubber Co.	Pfd. 3½ s.a.	Jan. 1	Dec. 29
Firestone Tire & Rubber Co.	6% pfd. 1½% q.	Jan. 15	Jan. 1
Firestone Tire & Rubber Co.	7% pfd. 1¾% q.	Feb. 15	Feb. 1
Goodrich, B. F., Co., The	Pfd. 1¾% q.	Jan. 2	Dec. 22
Hood Rubber Products Co., Inc.	Pfd. 1¾% q.	Dec. 1	Nov. 21
Kelly-Springfield Tire Co.	6% pfd. 1½% q.	Jan. 3	Dec. 16
Monatiquot Rubber Works Co.	Pfd. $1.75 q.	Jan. 3	Dec. 24
Russell Manufacturing Co.	Com. 2%	Dec. 15	.....
Safepack Mills	Pfd. 2% q.	Dec. 1	Nov. 21
Salmon Falls Manufacturing Co.	Com. 2½% q.	Dec. 1	Nov. 21
United Shoe Machinery Co.	Com. $0.50 q.	Jan. 5	Dec. 19
United Shoe Machinery Co.	Pfd. 1½ q.	Jan. 5	Dec. 19
Westinghouse Electric & Manufacturing Co.	Com. 2% q.	Jan. 31	Dec. 31
Westinghouse Electric & Manufacturing Co.	Pfd. 2% q.	Jan. 16	Dec. 31
Winnsboro Mills	Com. 2% q.	Jan. 3	Dec. 15
Winnsboro Mills	Pfd. 1¾% q.	Jan. 3	Dec. 15

Akron Rubber Stock Quotations

The following are closing quotations of December 14, supplied by the App-Hillman Co., Second National Building, Akron, Ohio:

	Bid	Asked
American R. & T. Co., com.	30	40
Amazon Rubber Co., The	10	20
Firestone T. & R. Co., com.	58	60
Firestone T. & R. Co., 6% pfd.	79	85
Firestone T. & R. Co., 7% pfd.	70	73
General T. & R. Co., The, com.	200	210
General T. & R. Co., The, 7% pfd.	89	95
Goodrich, B. F., Co., The, com.	37	38
Goodrich, B. F., Co., The, pfd	85	86
Goodrich, B. F., Co., The, 5-yr. 7% notes	98	99
Goodyear, T. & R., Co., The, com.	11½	12½
Goodyear, T. & R., Co., The, 7% pfd.	26	27
Goodyear, T. & R., Co., The, 8% prior pfd.	66	68
India T. & R. Co., com.	60	66
India T. & R. Co., The, 7% pfd.	65	75
Mason T. & R. Co., The, 7% pfd.	45	49
Mason T. & R. Co., The, com.	6½	7½
Mason T. & R. Co., The, 7%	45	49
Marathon T. & R. Co., com.	3	4
Miller Rubber Co., The, com.	66	70
Miller Rubber Co., The, 8% pfd.	80	85
Mohawk Rubber Co., The	90	110
Republic Rubber Corporation, com.	..	25c
Republic Rubber Corporation, 7% pfd.	10	15
Republic Rubber Corporation, 8% pfd.	..	2¼
Rubber Products Co., The	30	45
Standard Tire Co., The, com.	..	80
Standard Tire Co., The, pfd.	..	80
Star Rubber Co., The, com.	..	75
Star Rubber Co., The, 8% pfd.	..	90
Swinehart T. & R. Co., The, com.	..	40
Swinehart T. & R. Co., The, 7% pfd.	..	70

New York Stock Exchange Quotations

DECEMBER 22, 1921

	High	Low	Last
Ajax Rubber Co., Inc.	15⅜	15¼	15⅜
Fisk Rubber Co., The	12⅜	12¼	12⅜
Goodrich, B. F., Co., The	35⅜	34½	34½
Goodrich, B. F., Co., The, pfd.	83	83	83
Kelly-Springfield Tire Co.	42¼	41	41
Keystone T. & R. Co., Inc., The	15⅛	14⅞	14⅞
Lee R. & T. Corporation	28½	28¼	28¼
United States Rubber Co.	54¾	53¼	53⅜
United States Rubber Co., 1st pfd.	103⅛	99½	99½

New Incorporations

Adamant Rubber Products Co., Inc., December 16 (New York), $500,000. J. M. Strauch, 305 West 98th street; H. Oppenhaim, 13 East 113th street; P. J. O'Connor, 120 West 90th street—all in New York City. To manufacture rubber goods, etc.

Advance Hose Manufacturing Co., November 22 (Delaware), $100,000. G. J. Holden, president, Atlantic City, New Jersey; H. R. Peterman, secretary and treasurer, 4413 North 8th street, Philadelphia, Pennsylvania. Principal office, 132 North 4th street, Philadelphia, Pennsylvania. To manufacture high pressure hose and high pressure couplings.

Apple Gum Co., Inc., December 12 (Delaware), $1,000,000. S. E. Dill; M. A. Bruce; C. H. Blaske—all of Wilmington, Delaware. Delaware agent, Corporation Trust Co. of America, Du Pont Building, Wilmington, Delaware. To manufacture, buy, sell and deal in chewing gum, etc.

Ashtabula Tire & Rubber Co., December 14 (Ohio), 6,500 shares no par common. C. J. Davis; H. Ford; R. E. Roehm; M. A. Maroni; N. I. Young—all of Ashtabula, Ohio. Principal office, Ashtabula, Ohio. To manufacture tires, tubes and rubber articles.

B & B Tire & Rubber Co., November 14 (West Virginia), $5,000. G. E. and J. H. Beans; G. L. Bauer; A. M. Hodgers—all of Wheeling, West Virginia. Principal office, 5 Twelfth street, Wheeling, West Virginia. To buy and sell tires, tubes and accessories.

Berryman Rubber & Tire Corporation, November 28 (New York), $200,000. H. M. Wise; J. H. O'Connell; W. G. Saxon—all of 7 Dey street, New York City. To manufacture tires, etc.

Blackstone Linen Works, Inc., November 19 (Massachusetts), $100,000. J. Katz, president; S. W. Fleisher, treasurer and clerk, both of 60 Chauncy street; J. P. Sylvia, Jr., director, 24 Milk street—both in Boston, Massachusetts. Principal office, Boston, Massachusetts. To buy, sell, manufacture and deal in linen, cotton, rubber, etc.

Century Rubber Co., December 12 (Ohio), 500 shares, no par common stock. I. W. Campbell; D. B. McClay; N. H. Justice; D. W. Maxon—all of Barberton; C. E. Snively, Akron—both in Ohio. Principal office, Barberton, Ohio. To manufacture and deal in anything made of rubber.

Commonwealth Tire & Rubber Co., November 22 (Delaware), $50,000. T. L. Croteau; M. A. Bruce; S. E. Dill—all of Wilmington, Delaware. Delaware agent, Corporation Trust Co. of America, Du Pont Building, Wilmington, Delaware. To manufacture hose, belting and rubber goods in any form.

Connecticut Hard Rubber Co., October 22 (Connecticut), $10,000. J. A. Moffitt, president; A. A. Smith, vice-president and treasurer; W. Baxter, secretary. Principal office, 600 State street, New Haven, Connecticut. To manufacture hard rubber articles.

Crocker-Hobday Rubber Co., October 22 (Massachusetts), $5,000. E. O. Hobday, president; G. I. Crocker, treasurer, both of Fitchburg; F. A. Jewell, clerk, Lawrence—both in Massachusetts. Principal office, Taunton, Massachusetts. To manufacture and deal in rubber goods.

Fairbairn & Finley, Inc., December 19 (New York), $10,000. W. F. Franz, 56 Auburn avenue, Utica; G. H. Finley, 843 Potomac avenue, Buffalo—both in New York; D. S. Fairbairn, 151 East 22nd street, Erie, Pennsylvania. Principal office, Utica, New York. To manufacture tires, etc.

Giant Tire & Rubber Co., November 19 (Ohio), $10,000. C. E. Hart; D. E. Reynolds; F. C. Burk; L. H. Swisher; G. H. Sawyer—all of Findlay, Ohio. Principal office, Findlay, Ohio. To manufacture and deal in rubber tires and other rubber goods

Goodyear Tire & Rubber Co., Inc., December 5 (Delaware), $100,000. S. E. Dill; M. A. Bruce; C. H. Blaske—all of Wilmington, Delaware. Delaware agent, Corporation Trust Co. of America, Du Pont Building, Wilmington, Delaware. To deal in tires, rubber goods, etc.

Health-Win Products Co., November 28 (Delaware), $100,000. J. E. and R. A. Stanton, both of 4123 North Paulina street, Chicago, Illinois; E. E. and L. D. Jester, both of 508 Carrol avenue, Washington, D. C. Delaware agent, 927 Market street, Wilmington, Delaware. To manufacture and deal in rubber, gutta percha, etc.

Hillside Tire & Supply Co., Inc., November 28 (New York), $5,000. M. and W. Braunstein, both of 12230 Hillside avenue, Richmond Hill; S. Friedman, 236 South 2nd street, Brooklyn—both in New York. To deal in tires, etc.

Horrocks Rubber Co., October 11 (Ohio), $50,000. A. C. Horrocks; L. W. Akins; H. T. Gillen; H. A. King; B. R. Beckwith—all of Akron, Ohio. Principal office, Akron, Ohio. To manufacture and deal in rubber products of all kinds.

Kent Tire & Rubber Co., December 12 (Ohio), $5,000. D. M. Mason; W. A. Cliff; O. C. Clement; H. M. Johnson—all of Kent, Ohio. Principal office, Kent, Ohio. To manufacture tires.

Marco Rubber Corporation, December 12 (New York), $10,000. P. DeMartino, president; K. D. Smith, R. Bersani, vice-presidents; J. W. Barnell, secretary and treasurer. Principal office, 406 Commercial Building, Syracuse, New York. To manufacture and sell Marco rubber heels.

New York Tire & Rubber Co., Inc., December 13 (Delaware), $25,000. T. C. and A. Restifo; V. M. Teano—all of Washington, D. C. Delaware agent, Capital Trust Co. of Delaware, Dover, Delaware. To manufacture and trade in tires, tubes, rubber goods, etc.

Oklahoma Tire & Supply Co., October 29 (Oklahoma), $50,000. H. and S. M. Sanditen, both of Okmulgee; A. Lack, Henryette—both in Oklahoma. Principal office, Okmulgee, Oklahoma. To deal in tires.

Paramount Webbing Co., Inc., November 23 (New York), $10,000. A. M. and G. Rabinoff, both of 122 West 144th street; D. L. Sprung, 219 East 12th street—both in New York City. To manufacture elastic webbing, etc.

Peace Tire Co., November 18 (Alabama), $6,000. W. H. Peace, president; W. L. Rosamond, vice-president; R. H. Webb, secretary and treasurer. Principal office, Birmingham, Alabama. To deal in tires.

Portage Rubber Co., December 3 (Ohio), $1,550,000. F. Seiberling; R. Gunther; J. B. Huber; R. L. Branman; C. E. Hamlen—all of Akron, Ohio. Principal office, Akron, Ohio. To deal in rubber and rubber products.

Red Devil Patch Co., The, October 1 (Kentucky), $50,000. E. W. Bryan; P. C. Smithson; R. F. Warren; J. M. Greenfield; A. K. Goodwin. Principal office, Hopkinsville, Kentucky. To manufacture a tire patch known as Devil-Grip.

Reebilt Tire Co., October 21 (Maryland), $30,000. J. C. Young, 623 Keefer Place, N. W.; J. Schrot, 459 M street, N. W.; E. Parenteau, 1306 Belmont street, N. W.; J. T. Clemens, 610 Gresham Place, N. W.; H. T. Jones, 1900 S street, N. W.—all in Washington, D. C. Principal office, 301 South Catherine street, Baltimore, Maryland. To deal in tires, etc.

Respess Super Tire Fabric Co., November 30 (Delaware), $200,000. W. I. N. Lofland; F. Jackson; M. W. Cole—all of Dover, Delaware. Delaware agent, Capital Trust Co. of Delaware, Dover, Delaware. To manufacture and deal in goods of every class and description and also to acquire and develop patents, etc.

Rote Leather Products Co., November 23 (Delaware), $3,000,000. C. T. Cohee; C. B. Outten; S. L. Mackey—all of Wilmington, Delaware. Corporation Service Co., Wilmington, Delaware. To manufacture and deal in rubber, leather, etc.

Rubber Shock Insulator Co., Inc., December 12 (Delaware), $250,000. C. H. Jarvis; L. B. Phillips; M. F. Vance—all of Dover, Delaware. Delaware agent, United States Corporation Co., Dover, Delaware. To purchase and sell rubber goods.

Salem Rubber Co., October 31 (Ohio), $250,000. G. Hall; C. T. Young; J. J. Isensee; H. L. McCarthy; L. P. Metzger—all of Salem, Ohio. Principal office, Salem, Ohio. To manufacture and deal in tires, etc.

Sevier Tire Co., September 20 (Ohio), $10,000. F. P., P. J., and O. Sevier, and O. Dickason, all of Lima; E. Abe, Wapakoneta—both in Ohio. To deal in tires and tubes.

Simplex Rim Co. of New Jersey, November 26 (New Jersey), $250,000. F. R. Hansell; I. C. Clow; J. A. MacPeak—all of 417 Market street, Camden, New Jersey. Principal office, 417 Market street, Camden, N. J. To manufacture and deal in tires, rims and accessories.

Southeastern Tire Co., November 25 (South Carolina), $5,000. D. Smith, president and treasurer; M. L. Smith, secretary. J. A. Thomas, vice-president. Principal office, Charleston, South Carolina. To deal in tires and accessories.

Stephens Tire Stores Co., September 17 (Missouri), capital stock, $250,000 preferred and $100,000 common. H. C. Ford, president; D. Harman, E. S. Phillips, vice-presidents; W. H. Clark, secretary; L. R. Peairs, treasurer. Principal office, 1600 Grand avenue, Kansas City, Missouri. To deal in tires.

Subers Rubber Products Co., December 13 (Ohio), $25,000. L. W. Subers; A. Towl; S. E. Kerber; E. Masman; W. Rose—all of Cleveland, Ohio. Principal office, Cleveland, Ohio. To manufacture all kinds of rubber products.

Tadellos Tire Armor Co., October 21 (Ohio), $25,000. C. B. Felty, 1010 Vine street; J. W. Shorten, 514 Richmond street; C. S. Fisher, 1712 Holloway avenue; J. W. Fisher, 1330 Chapel street—all of Cincinnati, Ohio. Principal office, Cincinnati, Ohio. To manufacture and deal in armored pneumatic tires.

Tire Manufacturers Distributing Co., November 28 (Ohio), $10,000. H. Preusen, 444 Hana Building; G. H. Burrows, 7506 Franklin avenue; S. T. Kearns; A. Fleisher, all in Cleveland; J. H. Morris, 1219 Crawford avenue, Lakewood—both in Ohio. Principal office, Cleveland, Ohio. To deal in tires and tubes.

Waldman & Basson, Inc., December 5 (New York), $10,000. F. Weiss, 500 West 175th street; E. Waldman 1975 Creston avenue, both in New York; L. Basson, 238 Vernon avenue, Brooklyn—both in New York. To manufacture tires and accessories.

The Rubber Trade in the East and South

Manufactured Goods

The current seasonal restriction of trade is accepted in a matter of fact way and does not lessen the encouraging outlook for the New Year. In eastern rubber manufacturing centers the mechanical goods output is reported not over 60 per cent of capacity. Dealers' buying of tires for spring trade has begun and after the first of the year will serve to advance tire manufacturers' output beyond the present 40 per cent basis.

Dealers' stocks of tires were never so small and perhaps the gyp dealer was never more active in the trade. Insulated wire is in better demand while automobile topping shows reduced activity over a month ago. In weather-proofed clothing production is at a minimum. Snow and rain over extended New York and near-by territory have served to relieve retailers of some of their stock of rubber footwear which will contribute to aid factory production later on.

It is worth noting that the outlook for increased demand for rubber goods early in 1922 has served to convince some progressive manufacturers that the present is an opportune time for the installation of new machinery either as additional facilities or to replace worn out and antiquated machinery at pre-war prices.

Eastern and Southern Notes

J. F. Williams, 170 Broadway, New York, N. Y., has been appointed eastern sales representative for the H. H. Robertson Co., whose general offices are in the First National Bank Building, Pittsburgh, Pennsylvania. Mr. Williams was formerly in charge of the sale of Robertson Process mineral rubber and asphalts with John S. Lamson & Bro., Inc., the latter organization having acted in the capacity now assumed by Mr. Williams. The Robertson plants for the manufacture of paint, special asphalts, roofing and building products, are at Ambridge, Pennsylvania; Akron, New York; Waltham, Massachusetts; and Sarnia, Ontario, Canada.

It is announced that the firm of Barnard-Lynah, 321 Broadway, New York, N. Y., has been appointed sole selling agent for the Westville Spinning Co., Taunton, Massachusetts, manufacturer of underwriters' yarn for the rubber trade. Officials of the former organization are: O. A. Barnard, president, and James Lynah, vice-president.

Edward H. Fitch, manager of the Republic Rubber Corporation, Youngstown, Ohio, announces the appointment of Edwin Allan Lightner as eastern district manager with headquarters in New York, N. Y. Mr. Lightner had had a creditable record as a sales organizer before the war, and later held an important position on the commission of training camp activities. His most recent connection has been with The B. F. Goodrich Rubber Co., as its western Connecticut sales manager.

The Continental Rubber Works, Philadelphia, Pennsylvania, has designated W. Westover its representative in the State of New York, at 41 Warren street, New York, N. Y.

George H. Lincks, 1 Liberty street, New York, N. Y., has been recently appointed by the Pioneer Asphalt Co., Lawrenceville, Illinois, as the company's agent for the states of New York and New Jersey. Mr. Lincks, who has specialized in the varnish gum industry, will handle, in his new connection, the entire line of mineral rubber and asphalt goods manufactured by the Pioneer company.

W. D. Schwartz, vice-president of L. H. Butcher Co., Inc., recently returned from a three-months business trip to England and the Continent. His company, with offices and warehouses at New York, Akron, San Francisco, Los Angeles and Seattle, specializes in colors and chemicals for the rubber trade.

Reichard-Coulston, Inc., specialists in rubber makers' colors, has removed from 303 Fifth avenue to 95 Madison avenue, New York, N. Y.

The Mason Tire & Rubber Co., Kent, Ohio, has appointed J. A. Richardson eastern district manager, succeeding W. J. Ruckert, now in charge of the western district. Mr. Richardson formerly held a similar position with The Portage Rubber Co., Akron, Ohio.

George C. Martens has been appointed general assignee for the benefit of the creditors of John S. Lamson & Bro., Inc., 100 John street, New York, N. Y. This firm, as successor to Reese, Lamson & Buckley, Inc., has been operating as importer and dealer in manganese, pitch, waxes, chemicals, varnish makers' supplies, etc.

C. R. Heaume, for several years associated with The Mexican Crude Rubber Co., Detroit, Michigan, having been both on this company's plantations in the Federated Malay States, and later in its New York City offices, is now with G. E. Habich, crude rubber broker, 24 Stone street, New York, N. Y.

Executive and sales offices of the New England Tire & Rubber Co., Inc., manufacturer of "Holyoke" cord tires and tubes, have been recently opened in the Fisk Building, Broadway and 57th street, New York, N. Y. Still further recent developments are the establishment of branch stores in Washington, D. C., and Jacksonville, Florida, and others contemplated, for the sale of this company's products.

States Metals Co., 30 Church street, New York, N. Y., manufacturer of rubber compounding ingredients, has announced the appointment of Harry T. Kraft as sales representative for the metropolitan and Trenton districts.

Charles B. Seger, president of The United States Rubber Co., has been named a director of the National Surety Co., 115 Broadway, New York, N. Y.

Stephen H. Sears, who was in Akron for a considerable period while associated with the Firestone Tire & Rubber Co. of that city, is now in the New York office of James C. Baldwin & Co., crude rubber brokers, 68 Nassau street.

John B. Johnston and John S. Worley have been appointed receivers in equity for the Habirshaw Electric Cable Co., Inc., Yonkers, New York; including also the Electric Cable Co. and the Bare Wire Co., Inc., as affiliated organizations. The Habirshaw Electric Cable Co., Inc., is capitalized at $925,000, and the two last-mentioned companies at $1,500,000 and $500,000 respectively. Operations are being continued at three of the plants, with one running double shift. Net profits have been made every month since and including June of this year, and each month has shown a substantial gain over previous ones. During the last six months the company has not only increased its business, and earned the net profits referred to, but it has also substantially reduced old debts, incurred no new liabilities, disposed of the surplus stock, increased its efficiency and cut deeply into administration and operating expenses. Up to the time of the recent financial depression the Habirshaw company had had thirty-six years of progressive development.

A recent fire at the new plant of The Seamless Rubber Co., Inc., New Haven, Connecticut, started from an explosion in a tank of naphtha cement, and practically destroyed the sixth and top floor of the north wing of the building. The loss, covered by insurance, is variously estimated from $100,000 to $500,000. It is interesting to note that the modern method of fighting fire by steam was used here with considerable success.

The recent appointment of W. H. Olmstead as sales manager for the Carlisle Tire Corporation, Stamford, Connecticut, has been announced. P. V. Zimmerman is treasurer of this organization.

A novel plan of advertising has been recently adopted by the B. C. Tillinghast Co., Inc., 236 Market street, Philadelphia, Pennsylvania. This company, as jobber, manufacturer, and distributer of rubber goods, has been in business for 45 years, and this fact, as well as other advertising matter, is set forth in several different styles of circulars, which have been prepared in order to introduce their special salesmen. Officers of this company are: A. W. Tillinghast, president; J. K. Carr, vice-president and general manager; F. F. Crippen, secretary and treasurer; and Adolph F. Dirrigl, assistant manager.

The merging of the organization known as Currie Bros., with the Tirometer Valve Corporation of America, Charleston, West Virginia, has been recently announced, the consolidation being considered advantageous to both companies. Under the new arrangement the officials include: Justus Collins, president; George P. Daniels, vice-president; S. A. Moore, secretary and treasurer; and E. H. Currie and J. W. Currie, sales managers. This corporation's products are the "Tirometer" combined valve and gage for tires and the "Tirometer" heavy touring inner tube described in earlier issues of THE INDIA RUBBER WORLD.

CHEMICAL MANUFACTURERS' ASSOCIATION

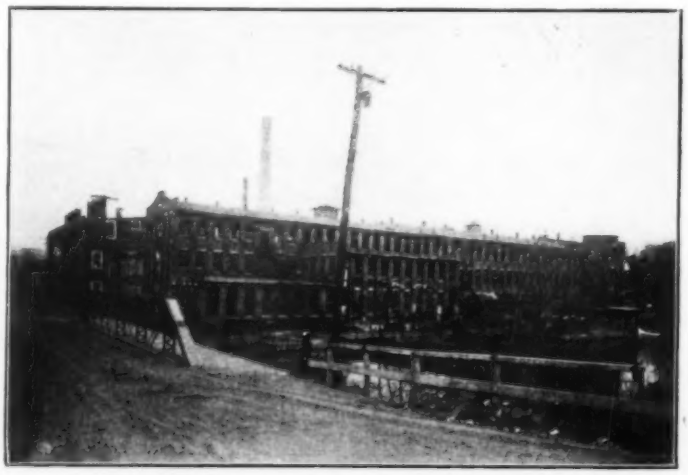
Press notices state that on December 9, at the Pennsylvania Hotel, New York, N. Y., the concluding organization meeting of the Synthetic Organic Chemical Manufacturers' Association was held. Immediately preceding the meeting of the General Association, meetings of the four sections of the association were held, namely: pharmaceuticals, intermediates, dyestuffs, and fine organic chemicals were represented. Members of the latter section have chosen as their vice-president P. Schleussner, of the Roessler & Hasslacher Chemical Co., New York, N. Y., while three additional members were elected to the board of governors, Frank L. McCartney of the Monsanto Chemical Works, St. Louis, Missouri; James T. Pardee, Dow Chemical Co., Midland, Michigan; and Donald McKesson, McKesson & Robbins, New York, N. Y.

ACCESSORIES TO BE FEATURED AT COMING NATIONAL AUTOMOBILE EXPOSITIONS

At the coming National Automobile Expositions to be held in the Grand Central Palace, New York, N. Y., January 7-14, and in Chicago, January 28 to February 4, special attention is being given to the display of automobile accessories, and most of the exhibitors are members of the Motor and Accessory Manufacturers' Association. In both New York and Chicago the accessory manufacturers exhibiting will probably total 250 to 300, while the makes of cars to be displayed will number 92 for New York and 80 for Chicago. It is expected that delegations of foreign visitors will be larger than last year, and every effort is being made to represent the progress of American manufacturers, and to render the expositions a success.

THE PEQUANOC RUBBER CO.

Twenty years ago, with a capital of $60,000, the Pequanoc Rubber Co. began the manufacture of reclaimed rubber on a modest scale in a small plant at Butler, New Jersey, utilizing about 200 horse-power and producing about 4,000 pounds of reclaimed rubber a day. The special needs of each branch of the rubber manufacturing industry were studied and catered to successfully from the start.



Plant of the Pequanoc Rubber Co., Butler, New Jersey

The list of the company's stocks have steadily increased in variety and adaptability, each rigidly standardized as to quality for a special need. Coupled with standardized quality the company has stressed the principle of service to its patrons. This combination has led to constant and gratifying growth of capital

and plant required to keep pace with the increase of business.

In 20 years the capitalization of the company has been increased to $750,000, the original small factory has given way to the present modern plant comprising over five acres of floor area, employing 3,000 horse-power and having a capacity of 100,000 pounds daily.

This concrete success is a source of pride to Joseph F. McLean, president, and his associates, as a demonstration of the correctness of their policy of cooperating with rubber manufacturers in every line and with efficient service supplying rigidly standardized goods. The credit for these results is due to a well-balanced manufacturing and sales organization coordinated and controlled by capable leadership.

The officers of the company are: Joseph F. McLean, president; S. H. Dodd, treasurer; M. J. Gunter, assistant treasurer; Paul Witteck, secretary; C. C. Hopper and D. D. Smithyman, sales department, and C. J. Howell, technical superintendent.

The Rubber Trade in New Jersey

Manufactured Goods

New Jersey rubber manufacturers generally are operating their factories at about 70 to 75 per cent, except tire factories which are on about 40 per cent normal. Some exceptionally large contracts for inner tubes are known to have been placed with Trenton manufacturers.

The Rubber Manufacturers' Association of New Jersey

The annual meeting of The Rubber Manufacturers' Association of New Jersey was held at the Stacy-Trent Hotel, Monday evening, December 12. Dinner was served in the "Princeton" room, covers being laid for twenty guests. The annual reports of the treasurer and secretary were read and approved. Both statements showed the Association to be in a prosperous condition and with an increasing membership.

Officers were elected for the year 1922 as follows: Charles E. Stokes, president of the Home Rubber Co., was elected president to succeed John S. Broughton, president of the United & Globe Rubber Co. Frank D. Voorhees, treasurer of the Voorhees Rubber Manufacturing Co., Jersey City, was elected vice-president to succeed Charles E. Stokes. A. Boyd Cornell, treasurer and general manager of the Hamilton Rubber Manufacturing Co., was reelected treasurer and W. Henry Sayen, treasurer of The Mercer Rubber Co., was reelected secretary.

The Association now includes in its membership, in addition to all of the rubber manufacturers of Trenton, the following companies in other cities: Quaker City Rubber Co., Philadelphia, Pennsylvania; Electric Hose & Rubber Co., Wilmington, Delaware; Voorhees Rubber Manufacturing Co., Jersey City; The New Jersey Car Spring & Rubber Co., Inc., Jersey City, and the Howe Rubber Co., New Brunswick, both in New Jersey.

The inception of the organization dates back somewhat over five years and at first included only Trenton rubber manufacturers. John A. Lambert, treasurer and general manager of the Acme Rubber Manufacturing Co., believing that an association of this kind would be of great mutual benefit to Trenton manufacturers succeeded in bringing about the organization and was elected the first president, which office he held for three years. The benefits derived by the individual members have been numerous and of great value in many ways. This was particularly true of the war period and during part of the time since. One of the results of the frequent meetings of this organization is the building up of a spirit of good will and mutual interest among the members, the manifestations of which are of almost daily occurrence.

Trenton Notes

The strike or walkout of some of the employes of the Ajax Rubber Co., Inc., Trenton, came to an end early in December, the men returning to work according to the new schedule proposed by the company.

The Essex Rubber Co., Trenton, is very busy and operating to full capacity to supply the large demand for soles and heels.

The Hamilton Rubber Manufacturing Co., Trenton, has been exceedingly busy in its cotton rubber lined hose department. Several large contracts have been taken within the last few weeks including one large order from Philadelphia, and another from New York.

Arrangements will probably be perfected for the reopening of the Trenton plant of the Globe Rubber Tire Manufacturing Co., of which John S. Broughton was recently elected president.

Charles W. Carll's Sons are occupying their new plant at Linden street, East Trenton.

A dinner recently given at the Stacy-Trent Hotel in honor of C. H. Oakley, president and general manager of the Essex Rubber Co., Trenton, by The Foreman's Club of this company, was indicative of the regard in which this official is held, and the harmonious spirit prevailing in the organization. Interesting events in the history of the company were recalled, and a presentation made to Mr. Oakley. The dinner menu was printed upon large rubber leaves resembling those of the rubber tree.

Bergougnan Rubber Corporation, Trenton, has elected Jules Berthier president, succeeding Herbert H. Coleman, resigned; reelected Jean Grenier vice-president; Gaston Tisne, treasurer, succeeds Warren A. Clapp. T. W. Yates succeeds E. P. Weber, sales manager, resigned. The Etablissements Bergougnan, France, it is said, is planning to enlarge its business.

The office employes of the Empire Rubber Manufacturing Co., Trenton, have very pleasing monthly social entertainments. The recreation room of the office building is used for the purpose and the company contributes to the expense of these enjoyable affairs.

The Acme Rubber Manufacturing Co. is operating a night force in its mill room and molded hose departments. Business in some departments shows some improvement over last year at this time and the prospects are for night work in these departments for several months to come.

A. S. Cadwallader, Anchor Warehouse, Trenton, New Jersey, has been appointed Trenton representative of the Woburn Degreasing Co., Harrison, New Jersey, manufacturers of Woburn oil.

The Semple Rubber Co., Trenton, is running full capacity on "Semco" red inner tubes. The high quality of this product is so well established that active demand continues regardless of the season.

The many friends of W. J. B. Stokes, treasurer of the Thermoid Rubber Co., Trenton, will be glad to learn that he is on the way to restored health. Mr. Stokes is at present recuperating at Atlantic City.

J. Oliver Stokes, president of the Thermoid company, is back in Trenton and is now living at the Stacy-Trent Hotel. He has recently been joined by Mrs. Stokes. Mr. Stokes looks like his old self again and seems full of the same vim and vigor.

John T. Spicer, general sales manager of the Thermoid company, will start early in January on his semi-annual visit to the branch stores and selling agencies of the company. Mr. Spicer's trip will extend as far as the Pacific Coast.

The many friends of Mr. Wismer, office manager of the Thermoid Rubber Co., are very glad to know that he has sufficiently recovered from a severe attack of typhoid fever to enable him to visit his desk for a few hours daily.

John S. Broughton, president of the United & Globe Rubber Co., Trenton, reports a somewhat larger volume of business from the railroads. This company has a large business with them and is very much pleased with the improved outlook for the future.

The Woven Steel Hose & Rubber Co. is developing several new lines of hose and is meeting with much sale success. Horace Tobin, president and general manager of the company, is both persuasive and convincing when discussing the merits of these products.

Managers, superintendents, foremen and sub-foremen of the Essex Rubber Co., Trenton, gave the second of a series of banquets for department heads, in the Hotel Penn. L. M. Oakley acted as toastmaster, and responses were given by Harry Lutz, James Cartlidge and James Kennedy, the latter speaking on "My Seven Years in Japan." A pleasing musical program was a feature of the occasion, the guests also being entertained with humorous stories. Another banquet is planned for the coming month, the date to be decided later.

Miscellaneous New Jersey Notes

The temporary receivers of the Braender Rubber & Tire Co., Rutherford, New Jersey, have been dismissed and the company recently reorganized. Under the new ruling the firm is now a Delaware corporation, retaining, however, its former officers and directors. Production of tires at the plant has increased by 66 2/3 per cent, while the working force in the tube department has been increased 400 per cent. With orders still unfilled further increases will probably become necessary in the near future.

A continuous increase in operations during the recent financial depression, and excellent prospects for the future, are reported by the Maywald Rubber Co., sales offices, 86 Park Place, Newark, New Jersey. This organization, which specializes in the manufacture of household and surgeons' gloves, druggists' tubing and inner tubes, has recently added new machinery to its plant equipment, and is now in a position to render even better service than formerly. Executives of this company are: Frederick J. Maywald, president, and George C. Plummer, vice-president and treasurer.

Nelson M. Wrigley, formerly with the American Wringer Co., Woonsocket, Rhode Island, has resigned and accepted a position as superintendent of the mechanical roll department of the Manhattan Rubber Manufacturing Co., Passaic, New Jersey.

The Federated Engineers' Development Corporation investigates promising inventions and enters into a contract with the inventor to develop and market the invention at its own expense. The general offices and laboratories are at 154 Ogden avenue, Jersey City, New Jersey, and officers of the organization are the following: T. Irving Potter, president; Charles P. Steinmetz, vice-president; A. Russell Bond, secretary and technical manager; and H. E. Martin, treasurer.

The Rubber Trade in Massachusetts

Manufactured Goods

Business continues to gain slowly in many branches of the rubber business, although some lines have become very quiet. Manufacturers are generally hopeful, however, knowing the country's, and, indeed, the world's need of manufactured goods, and realizing that after the first of the new year normal or even abnormal buying may be resumed.

The winter weather which made its appearance late in November created a considerable retail business in four-buckle gaiters, rubbers and footholds, and literally swamped manufacturers with rubber shoe orders for immediate delivery. A disastrous sleet storm which greatly damaged electric light and telephone systems to the north and west of Boston has brought unusual calls for insulated wire. Up to this time the tire business had been rather better than anticipated.

Sales of druggists' sundries continue to improve as this is the buying season, but druggists are not stocking up to any great extent.

Massachusetts Notes

Massachusetts rubber manufacturers will be well represented at the eleventh annual convention and exhibition of shoe manufacturers to be held in Chicago, Illinois, from January 9 to 12 inclusive. The exhibition firms include the Avon Sole Co., Avon; Converse Rubber Shoe Co., Malden; Fellsway Rubber Co., Boston; Firestone-Apsley Rubber Co., Hudson, and the Hood Rubber Co., Watertown. Other companies to be represented are the Beacon Falls Rubber Co., Beacon Falls, Connecticut; Dryden Rubber Co., Chicago, Illinois; The B. F. Goodrich Co., Akron, Ohio; Goodyear Rubber Co., New York, N. Y.; The Goodyear Tire & Rubber Co., Akron, Ohio; United States Rubber Co., New York, N. Y. Approximately four hundred manufacturers of footwear, mostly leather, and shoe findings are on the list.

The plant of the American Tire Fabric Co., Newburyport, Massachusetts, was reopened December 27 on full time. The mill has been closed for the past ten weeks, and gives employment to about 250 hands. Automobile tire fabric is the product.

The Hanover Rubber Co., West Hanover, Massachusetts, has made large factory additions which increase daily capacity to between 50,000 and 60,000 pairs of rubber heels. The firm makes a specialty of private brand heels for different shoe manufacturers. A new Boston office has been opened in the Rice Building, 10 High street.

A meeting of the employment managers' division, industrial relations department, of the Associated Industries of Massachusetts was held December 20 at the plant of the Hood Rubber Co., Watertown. In the afternoon there was an inspection of service activities, including the employment and medical departments with brief explanations by division heads of methods and accomplishments in compensation insurance, thrift, loan and benefit plans, and health conservation. Supper was served in the new plant restaurant, followed by a short talk by General Superintendent Charles H. Roper and an explanation of the "point system" and its results.

The "point system" is an attempt to measure accurately the accomplishments of the individual worker as a basis for setting wages. Points are credited to workers for hourly accomplishments. Bonus payments are made to those above the average.

The Hood Rubber Co. has long been one of the most progressive leaders in service work, and this meeting proved of great interest and benefit to all who attended.

English and citizenship classes were started again during the last week in November at the plant of the Boston Woven Hose & Rubber Co., Cambridge, Massachusetts, and are now organized and in good working order.

The trustees of the Plymouth Rubber Co., rubber heel and sole manufacturers, of Canton, Massachusetts, have sent out a notice to creditors stating that an offer has been received for the assets of the company which is sufficient to pay all unsecured creditors 40 cents on the dollar, and recommending that this offer be accepted.

The address of Cyrus S. Ching, supervisor of industrial relations, United States Rubber Co., New York, N. Y., at the sixth annual meeting of the Associated Industries of Massachusetts, was concise and practical, touching upon the unsound practices of many employment management and service departments during the war, and outlining the logical activities of the sort of industrial relations department which is essential to efficient business management. Such personal activities, he believes, offer the mechanism through which to apply the Golden Rule in industrial relations.

The Converse Rubber Shoe Co., Malden, Massachusetts, is now operating at very near capacity. While the ticket does not equal the firm's peak production during the 1920-1921 season, it is regarded as normal and satisfactory. The company has recently paid the semi-annual dividend of 3½ per cent on its 7 per cent preferred stock.

As in Brockton, millions of rubber heels are being attached to the shoes manufactured in Lynn, Massachusetts, and Merrill, Porter & Co., of the latter city, have recently announced plans to have practically all their stock shoes made with rubber top lifts.

In accordance with the usual custom the new rubber footwear price-lists from all the leading manufacturers are anticipated January 1. While nothing official is obtainable at the time of writing, it is common opinion that prices for the coming year will be lower, the reductions averaging about 10 per cent.

Reports of satisfactory progress are received from the Middlesex Rubber Co., Reading, Massachusetts, although, in common with numerous other firms, a better business was enjoyed in November than in December. George E. Jeandheur, president and treasurer of the company, was formerly superintendent of the Mayflower Rubber Works Co., South Braintree, and when the new Middlesex company took over the Reading plant formerly operated by The McTernen Rubber Manufacturing Co., most of the Mayflower company's molds and machinery were purchased and installed there. Druggists' sundries, inner tubes and rubber bands are the products being manufactured at present.

Boston Notes

"Forsyth Day" was observed on November 21 at the Forsyth Dental Infirmary, the gift of Thomas A. Forsyth, former head of the Boston Belting Co. Special clinics, demonstrations and addresses by men prominent in the dental profession formed the program.

The Davidson Rubber Co., Boston, reports its plant operating at full capacity in anticipation of an active demand for druggists' sundries after the first of the year, which is the principal buying season for this class of rubber goods.

Employes of the United Shoe Repairing Machine Co. held their annual Christmas party on the evening of December 20, in one of the large offices of the company at 205 Lincoln street, Boston. Dinner was served, followed by an entertainment consisting of talent in the employ of the company. A grab bag and dancing concluded the evening. G. W. Brown, president of the United Shoe Machinery Corporation, and J. W. Meloon, managing director of the repair company, were guests.

James E. Odell, crude rubber broker, 200 Devonshire street, Boston, is the New England sales representative of States Metals Co., 30 Church street, New York, N. Y., manufacturer of rubber compounding ingredients.

FIRESTONE AND APSLEY ALLIED IN RUBBER SHOE MANUFACTURING

In approval of the recent alliance of the Firestone Tire & Rubber Co., Akron, Ohio, with the Apsley Rubber Co., Hudson, Massachusetts, L. D. Apsley, who founded the latter company 37 years ago and will remain its president, says:

"As president of the new company my every effort will be to give greater value and service to our customers. I am very sure that it is the most important step this company has taken in its more than 37 years of uninterrupted prosperity and growth.

"In H. S. Firestone I am allied with a man of progressive ideas, possessed of a broad conception of the rubber business. His vision has led to the creation of one of the largest business organizations in the country with connections extending around the world.

"It is a great satisfaction to me that Mr. Firestone, one of the greatest factors in the rubber industry, found that the Apsley Rubber Co. had the basic structure for the greater Firestone-Apsley Rubber Co. of the future.

"If there is one thing on which I have always insisted to the exclusion of every other consideration in the making of Apsley rubber shoes, *quality* is that factor. This is indicated by the fact that there has never been a time in recent years that we could take care of all the business that has been offered us.

"Combining our knowledge with the ripe experience and enterprise which Mr. Firestone now brings us, we can promise our customers the utmost in quality and service.

"All manufacturing of rubber boots, shoes and clothing will be done at Hudson. I am convinced that as we are now organized, with the united momentum of both organizations we are entering upon a period of unusual prosperity for ourselves and our present and future trade."

Master Textile Manufacturer of New England

William Whitman, textile manufacturer and merchant, of Boston, Massachusetts, was born at Round Hill, Annapolis County, Nova Scotia, May 9, 1842, a descendant of one of the early settlers of Weymouth, Massachusetts. At the age of eleven, following his education at Annapolis Academy, circumstances obliged him to begin making his own way in the world, and in the sixty-seven years which have followed, his self-reliance, indomitable energy, and business integrity have carried him to the very top of the New England textile manufacturing industry.

William Whitman

Entering the office of a wholesale dry goods store in St. Johns, New Brunswick, he went two years later to Boston, Massachusetts, as an entry clerk for the mercantile firm of James M. Beebe, Richardson & Co., where he was promoted through various departments for eleven years. In 1867 he became associated with R. M. Bailey & Co., as treasurer of the Arlington Woolen Mills, Lawrence, Massachusetts, a position which, except for six months in 1869, he occupied until 1902, when he became president, resigning the latter office in 1913, although still a director. During the six months of 1869 mentioned above, he devoted himself to a woolen mill at Ashland, New Hampshire, in which he had purchased an interest. It was his energy and foresight for nearly half a century which developed the Arlington Mills from a small concern into one of the largest textile organizations in the world, and drew him into the American worsted industry, to which he has contributed largely as a pioneer and creator.

In 1887 Mr. Whitman became a member of the firm of Harding, Colby & Co., commission merchants, of Boston, Massachusetts, and New York, N. Y., at that time selling agents for the Arlington Mills, and two years later, on the death of Mr. Colby, became managing partner of the succeeding firm of Harding, Whitman & Co. This business was taken over in 1909 by the new firm of William Whitman & Co., which was incorporated in 1913 as the William Whitman Co., Inc., with Mr. Whitman as chairman of the board of directors. This company now has a capital stock of $12,500,000 and offices in the leading cities of the country. In 1917 the cotton department of the Arlington Mills was purchased by the Arcadia Mills, a new $3,000,000 corporation of which Mr. Whitman is president. He is also president of the Textile Specialty Co., a $400,000 company organized in 1917 for the sale of specialty materials and fabrics, and of the Belleville Warehouse Co., a $475,000 corporation established to maintain in New Bedford, Massachusetts, a supply of 100,000 bales of cotton.

During the past twenty-five years Mr. Whitman has influenced the construction in Massachusetts of several large new mills for

which he acts as managing director. These include the Whitman Mills and Nashawena Mills, at New Bedford, manufacturing cotton cloths; the Katama Mills, at South Lawrence, weaving tire duck and other heavy fabrics; the Manomet Mills and the Nonquitt Spinning Co., at New Bedford, spinning cotton yarns, and the Monomac Spinning Co., at Lawrence, manufacturing worsted and merino yarns. The Manomet Mills have recently engaged extensively in the manufacture of cord tire fabric. Mr. Whitman is also a director of the Calhoun Mills, at Calhoun Falls, South Carolina.

The mill organizations under Mr. Whitman's management have, altogether, a capital of more than $50,000,000, operate nearly 1,000,000 spindles and produce each year 68,000,000 pounds of yarn and 39,000,000 yards of cloth, employing over 18,000 persons.

Despite his many business interests, Mr. Whitman has taken an active interest in the broader aspects of industrial development. He is a member of the National Association of Wool Manufacturers and was for many years its president; also a member of the National Association of Cotton Manufacturers, the American Cotton Manufacturers' Association and the New Bedford Chamber of Commerce. A Republican and an acknowledged authority in tariff matters, he has published many important papers on timely economic subjects.

His widespread affiliations with the social life of New England include membership in the American Academy of Political and Social Science, Boston Young Men's Christian Union, Massachusetts Historical Society, Nova Scotia Historical Society, Society for the Preservation of New England Antiquities, American Geographic Society, New England Historic-Genealogic Society, Bostonian Society, Brookline Historical Society, Bunker Hill Monument Association, First Corps Cadets, Navy Relief Society and other organizations. His clubs include the Arkwright, Union, Commercial, Norfolk, Home Market, Boston Press, Eastern Yacht and Brookline Country clubs.

Although sought on many public occasions, his tastes and inclinations are domestic and he finds his chief happiness in his beautiful home at Brookline, Massachusetts, with Mrs. Whitman, formerly Miss Jane Dole Hallett, of Boston. He has three daughters and four sons, three of whom are associated with him in the William Whitman Co., Inc., and a son-in-law, Franklin W. Hobbs, who is president of the Arlington Mills.

Manomet Mill No. 4, Producer of Yarns and Cord Tire Fabric

The Manomet Mills, at New Bedford, Massachusetts, the largest single producer of combed cotton yarns in the world, and of which William Whitman, of Boston, Massachusetts, is managing director, has recently completed and placed in operation its new mill No. 4 for the manufacture of yarns and cord tire fabric. The new mill comprises five brick buildings having a total floor space of 553,818 square feet, or over twelve and one-half acres.

The main mill measures 897 by 168 feet, three stories high. Its first floor is devoted to spooling, warping and twisting machinery, the equipment being one of the largest installations of large-size twisters in the country. On the second floor are located the carding and combing machinery, together with drawing frames and speeders. The entire third floor is occupied by 480 spinning frames carrying 115,200 spindles, it being the second largest installation of spinning machinery on one floor in New Bedford.

A mill office building, finished inside in tile brick, is located in front of the main mill.

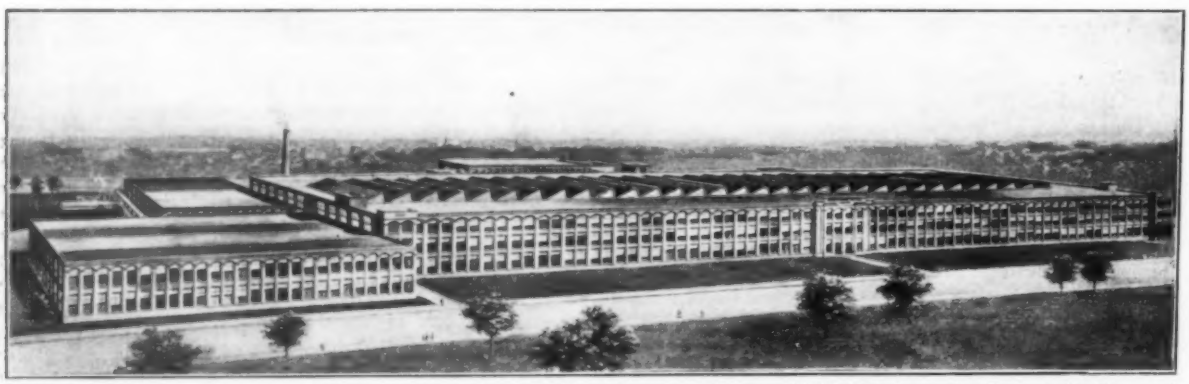
Adjoining the main mill is the weaving mill measuring 270 by 110 feet and two-stories high. On the first floor there are sixty-four huge cord tire fabric looms, the largest installation of this type of machines in this country. From 175,000 to 200,000 pounds of yarn a week will be required to keep them running. As new warps must be put into each loom almost daily an elaborate overhead trolley system is provided in order to handle the heavy beams by chain and fall, and to transfer them easily from one part of the plant to another. The second floor is occupied by warp compressing and other auxiliary machinery.

A picker building, 130 by 110 feet and two-stories high, adjoins one corner of the main mill. The opening and waste room is located on the first floor, with a dust pit in the basement, while the finisher picking is done by machinery on the second floor.

In the rear of the main mill, and connected with it on each floor, there is a repair shop 200 by 35 feet and two stories high. The basement contains a concrete tank having a capacity of 500,000 gallons of water for the use of the fire pumps. On the first floor are the fire pumps, sanitary arrangements and humidifying apparatus, while the second floor is an extensive repair shop for both wood and metal.

The entire plant is electrically driven by approximately 10,000 horsepower from the local electric company. Individual and group motor drives have been adopted so that there is practically no shafting whatever except in the card room. The spinning frames and combers run four to a motor and the speeders and twisters two to a motor. Except for heating and humidifying purposes there is little need for steam, and this is furnished by oil-burning boilers located at the rear of the mill.

With the completion of mill No. 4, Manomet Mills becomes one of the largest cotton manufacturing companies in the world. Its total output is from 750,000 to 800,000 pounds of combed yarns a week. This is approximately 10,831,697 miles of yarn a week or 3,761 miles of yarn a minute. Its annual cotton consumption will be about 100,000 bales, ranking second in the United States. It is, however, the largest consumer of high-grade extra



With the Addition of Manomet Mill No. 4, New Bedford, Massachusetts, Manomet Mills Becomes the Largest Producer of Combed Yarns in the World

long-staple cotton. Annual output will be worth about $43,000,000 and the wage scale for 4,500 operators will amount to $7,500,000 a year.

The Rubber Trade in Ohio

Manufactured Goods

The expected phenomenal spring-dating business predicted a month ago has arrived and practically every large and small tire manufacturing company is adding men to take care of orders. The B. F. Goodrich Co. originally intended to go to 15,000 tires a day but the new goal now is 20,000. The Goodyear Tire & Rubber Co. has restored production to 16,000 tires a day and has added the first of 3,000 men to be put on by the first of February. The Miller Rubber Co. is adding men and The Firestone Tire & Rubber Co. has been adding approximately 50 men a day for the past month. Practically all the smaller factories are making increases in working forces.

It is evident that the dealers throughout the country now realize that the time has come to buy tires if they expect to have goods to sell at the beginning of the next motoring season. Prices are at rock bottom; manufacturers have refused to manufacture stocks to be piled into their warehouses, and an actual shortage faces the country unless new stocks are made. These are the motives that will undoubtedly start the biggest spring-dating order business which has ever been experienced in the rubber industry.

The footwear industry will be back at normal by the middle of the coming January, according to present indications. Orders are rapidly increasing and with the opening of the selling season it is believed that dealers throughout the country will be ready to place large orders. Druggists' sundries continue to show some improvement, but the trade as a whole has not yet come to the point where it is ready to discard the hand to mouth buying policy and stock up to any extent. Mechanical goods sales continue to show slight improvement and by spring it is felt that this department of the rubber industry will be back to near pre-war normal.

Rubber Machinery Demand Increasing

The steel and iron industries in and about Akron, and closely associated with tire and other rubber goods manufacturing, have shown their stability during the past year and appear to be at the end of the period of stagnation and ready to enter into an era of much better business. In reviewing the past year it is remarkable that thus far not one company in this line of production in the Akron district has gone into a receivership, and although in some instances the future looked very black, they are, as many of them good naturedly express it "still here and ready for business as soon as it comes." The steel and iron manufacturers did not get caught with any inventories such as were on the hands of the rubber industry when the depression came, so that liquidation did not affect them in the same way.

The Akron Rubber Mold & Machine Co. is among the Akron rubber equipment manufacturers reporting much increased activity in European fields. During the past month the company has received a half dozen good orders from the Continent and has made shipment of some of the largest orders sent to Europe during the year. A general revival in rubber and tire manufacture overseas is reported to the company from its European connections.

The Franz Foundry Co. has found the entire year a fairly good one, all general conditions considered, the plant as a whole having been kept pretty close to 75 per cent of normal production since last March.

The Akron Gear & Engineering Co. reports that the past three weeks have shown some improvement, and while the orders on the whole are still comparatively small, the scattered sources indicate that a fairly good season may be anticipated.

The Ornamental Iron Works Co. has maintained operations around 65 per cent during the major part of the year, and finds no grounds for complaint. Business has definitely started and it is believed that it will improve after the beginning of the new year.

The Portage Iron & Wire Co. reports activities at better than half normal with a large number of inquiries being received from widespread sources, which appear as eventual business.

At the Vaughn Machinery Co., Cuyahoga Falls, Ohio, it is stated that a large amount of business is under consideration and that operations have continued pretty well on the same basis during the past two quarters.

The Akron Engineering Co., which recently moved into new offices, asserts that many clients who have been dormant during the past year are beginning to catch the spirit of the general revival and will probably start activities in the near future.

The Adamson Machine Co. states that business during the early part of December turned for the better with increased equipment buying in Akron and by rubber factories in other states. A recent large order which is doubling production, aided materially in making the month a good one. The company expects to be on a better than breaking-even basis by the first of the new year.

The Akron Equipment Co. has used the slow season for making improvements in its plant to be ready for the increased volume of business which is soon expected. Several thousand dollars have been expended in this work. Regarding the future of business the company officials assert that "they have quit guessing" and are going to wait the improvement that is expected with the new year.

General Closes Its Best Year

The General Tire & Rubber Co. looks upon 1921 as its best year, and although William F. O'Neil, vice-president and general manager refuses to take credit to himself, it nevertheless was due to his foresight and business acumen that the company is able to report a 33 per cent increase to unit production, a clean slate as far as bank loans amounting to more than $2,500,000 are concerned, at least fifty new dealers and dividends earned and paid during the year. The company confines its sales almost entirely to dealers and had no original equipment business to lose when the depression struck the automobile industry. Rigid economy was practiced, throughout the plant and office, and there was no let-up on sales at any time during the depression. The company has been in business since 1916, during which year its total sales amounted to $219,197. In 1920, sales amounted to $5,755,081, and for 1921 will be close to $6,000,000.

William F. O'Neil

Mr. O'Neil recently returned from a three months' tour of England, Ireland, France and Italy. He is impressed with the future of American tires and rubber goods in Europe and expresses the opinion that American tires are selling in as large numbers as are Continental makes.

Goodrich to Make 20,000 Tires Daily

The B. F. Goodrich Co. is planning for 20,000 tires daily as the goal for the first of the coming year and has already taken a long step toward it. During the last week in November 500 men were added to the pay-roll and plans have been completed to take on others as rapidly as the business demands

production increases. A large number of tire builders and finishers who were "carried" in other departments during the dull period have been placed back in their former jobs.

The company has officially announced bank loans reduced to $6,000,000 from the high point of $30,000,000, and is ready to make complete payment whenever it sees fit. Inventory has been reduced from $72,000,000 to $38,000,000 during the past year. What this statement for the year will be from the standpoint of net earnings is not known now, but the steps which have been taken to bring the company back to a normal basis have absorbed a large portion of the earnings and surplus.

Goodyear Finance and Sales Plans

The Goodyear Tire & Rubber Co. under its new financing must annually earn $14,822,228 to meet all capital, interest and sinking fund charges. Of this amount $6,400,000 is made up of interest and sinking fund charges on first mortgage bonds and debenture bonds. On prior preference stock the annual capital charge of $2,366,056 must be earned in addition to the $6,400,000 before the old preferred receives any returns. This appears possible as indicated by the statement at the end of the first seven months of the new regime. The dividend record shows that since 1915, the company has earned not less than $7,000,000 on the common after preferred dividends, with the exception of 1920, when the depression led to the refinancing of the company.

E. G. Wilmer, president of The Goodyear Tire & Rubber Co., in a statement to stockholders and security holders, urges that they take a deeper interest in the products of the company and assist the company and themselves by purchasing Goodyear products and also urging their friends to do the same. The plan is a novel one and has large potentialities. Thus far all the companies have refrained from giving out the number of stock and security holders, but based upon the Goodyear list of 65,000 stockholders alone the holders of rubber stock throughout the country are exceedingly numerous. The attempt to have this large army of men and women actual purchasers and boosters of their own company's products certainly lends itself to the imagination and probably to actual consummation.

H. H. Springford, formerly treasurer of The Goodyear Tire & Rubber Co., has been made assistant to the president and is in charge of the companys' affairs in the absence of E. G. Wilmer, president, who has gone to South America to inspect Goodyear properties and make an investigation of the future of the southern continent for the rubber industry. Mr. Wilmer will also study plans evolved by the previous Goodyear organization for a manufacturing plant in Argentina.

H. H. Springford

Mr. Springford is one of the men who came into the rubber industry through the reorganization of the Goodyear company. P. H. Hart has been named treasurer of the company to succeed Mr. Springford.

Frank K. Espenhain, who has been recently appointed export manager of The Goodyear Tire & Rubber Co., has a broad knowledge of financial interests, and has held several responsible positions. Beginning his business career in Milwaukee, Wisconsin, he became president and general manager of one of the department stores of that city, later becoming active in the bond and advertising business. During the war he rose to the rank of colonel, and had charge of much of the warehousing of war materials throughout the country. Since then he has been in New York City, exporting tires, tubes, and rubber goods.

Other Goodyear appointments include: H. J. Thompson, manager of the sole and heel department, succeeding H. L. Post, with K. W. Wolcott assistant manager; H. P. Post, assistant manager of mechanical goods department, succeeding C. A. Jones, with O. R. Burr still head; F. W. McConkey, acting manager of tire sales in the southern division, succeeding H. I. Walters; D. O. Kinnie succeeds L. C. Gates in charge of motorcycle tire sales; T. J. Moore succeeds H. A. King as editor of the *Triangle*.

Tracy A. Douglas, cord tire department, has been elected president of the Senate of the Goodyear Industrial Assembly, and I. C. Berry, department 102C-2, speaker of the House, for the ensuing year.

Ten-year service pins have been awarded to Robert Massingale and Charles G. Warnick, by the Goodyear company. Twenty-five 5-year pins were also awarded to other employes.

Goodyear Building Dirigible Gas Containers

The Goodyear Tire & Rubber Co. is building eighteen ballonets to serve as gas containers for the ZR1, which was to have been the sister ship of the ill-fated ZR2 that exploded on her trial trip in England before starting to America. The ZR1 will be as large as the ZR2 and will be the first rigid type dirigible built in the United States. It is also the first dirigible built in this country in which gold-beaters' skin is being used. The use of this material for dirigible gas containers was introduced by Goodyear from England by having an expert in its fabrication come to this country to instruct the aeronautical department.

Each of the eighteen ballonets contains from 18,000 to 20,000 cubic feet of gas space and each is almost as large as the "pony blimps" which have been made famous by the American Army. The new dirigible will be assembled at Langhurst, New Jersey. This is the first direct evidence that the Government intends continuing the rigid type dirigible construction plans. It is stated by experts here that the defects which are believed to have led to the disaster of the ZR2 have been overcome in the designs for the new airship.

Seiberling Rubber Co. Progress

The Seiberling Rubber Co. has started stock sales on the first $2,000,000 of the $10,000,000 authorized, and indications are that little difficulty will be encountered in disposing of this stock. Production will begin at the Portage plant, which was taken over by the Seiberling company, shortly after the first of the new year.

The Seiberling Rubber Co. was fortunate in obtaining the Portage plant so cheaply, and for that reason its stock will have a comparatively large book value while its per tire capitalization will be low. The plant, which was obtained for $800,000 worth of stock, is worth, in the opinion of rubber men, at least three times that amount.

Mr. Seiberling entered the rubber industry a second time with everything in his favor. Raw materials are low, wages have decreased, his name is well known and the market for tires is exceedingly good. Molds for the manufacture of the Seiberling tire are now being made. This will be built at the Portage plant, while the Portage tire will be made at the Lehigh Rubber Co.'s plant at New Castle, Pennsylvania.

A number of former Goodyear men have joined the Seiberling company during the past month. Among them are Willard Seiberling, son of Frank Seiberling, and H. L. Post, C. A. Jones, H. I. Walters, L. C. Gates, and Harold King.

Akron Notes

It is announced that Charles W. Simpson has been appointed sales manager of The American Rubber & Tire Co., Akron. This organization manufactures tires, accessories, "5 Minute" vulcanizing cement, and "Indian" red tubes.

A school for teaching methods of vulcanizing rubber footwear has been recently established by Arthur's Vulcanizing Equip-

ment Co., 350 Bowery street, Akron. The various processes involved in such work are of late receiving much attention from repair men.

The reopening on January 1, 1922, of their former Akron, Ohio, offices in the Central Savings & Trust Building is announced by MacArthur & White, Inc., crude rubber brokers, 150 Nassau street, New York, N. Y. Mr. White, who has spent nine years in the Akron territory, will return to that city for the present.

The Avalon Rubber Manufacturing Co., Akron, Ohio, now in the hands of temporary receivers, is reported by officials of the company as being very busy, with encouraging prospects for the future. This organization, incorporated in 1917, is capitalized at $1,500,000, and now has about $300,000 outstanding stock, with permanent and current assets of over $200,000 and liabilities of about $25,000. The products of the company include mechanical molded goods, covering such items as gaskets, bumpers, packings, heels and soles and various other special molded articles. J. F. Hower is president and general manager of the organization.

The American Hard Rubber Co., Akron, after a good month in November, experienced a falling off of orders in December due to the slowing up of the automobile industry. With excellent prospects for good business in the automobile factories after the first of the year the company hopes for improvement.

The National Sulphur Co., New York, N. Y., which sells a large part of its output to rubber factories, is building a branch factory at Akron which will cost approximately $500,000 when completed and will employ 250 men. Excavation for the building is already under way and operations should start early in 1922, according to present plans. The plant was brought to Akron by the recently created industrial bureau of the Akron Chamber of Commerce.

Fred J. Horn, formerly in the crude rubber business in Akron, and more recently a member of the firm of Horn & Leavitt, New York, has been appointed Akron representative of James C. Baldwin & Co., crude rubber brokers, 68 Nassau street, New York, N. Y. Mr. Horn's office is in the Ohio Savings & Trust Building, Akron.

Miscellaneous Ohio Notes

The entire plant, equipment, and assets of the The Rotary Tire & Rubber Co. have been sold to the Studebaker-Wulff Rubber Co., Zanesville, Ohio, in consideration of the latter assuming the debts and liabilities of the former. As a result of this arrangement, and under excellent financial conditions, operations began December 1, 1921, at the Rotary plant, also in Zanesville, where tires of the best quality will be manufactured. F. A. Rendon, secretary and export manager, was formerly export manager of the Lee Tire & Rubber Co., New York, N. Y.

Robert F. Brown has been recently appointed treasurer of The Dayton Rubber Manufacturing Co., Dayton, Ohio. Mr. Brown has had much financial experience which qualifies him for meeting the increasing requirements of the Dayton company, whose business, it is stated, has doubled in 1921, and will in all probability, continue to increase in 1922. J. A. MacMillan is president and general manager of the company.

After January 1, 1922, The Cooper Corporation, Cincinnati, Ohio, will discontinue selling tires other than of its own manufacture, and will take over all of the plants, equipment and other assets of The Giant Tire & Rubber Co., including those factories known as the North and South plants, at Findlay, Ohio. At the last-mentioned factory, which has a capacity per day of from 1,000 to 1,250 tires, approximately 200 tires a day are now being produced, and this output will gradually be increased to take care of the entire requirements of the Cooper company's sales organization, known as the I. J. Cooper Rubber Co. The manufacture of rebuilt tires will be continued at the North plant. The Giant Tire & Rubber Co., organized in 1914, with approximately $3,000 capital, has met with remarkable success, the value of its 1920 sales approaching $1,500,000.

Recent additions to the executive and sales force of the Republic Rubber Corporation, Youngstown, Ohio, include the following: E. H. Fitch, as manager; J. H. Connors, as manager of mechanical sales; and S. C. Corey, district manager of the new Philadelphia district. All three of these men have had much experience in the rubber industry, and all have for years held positions of responsibility with The B. F. Goodrich Co. Under the management of C. H. Booth, as receiver, and with the assistance of the executives above named, it is believed that this corporation will find a way out of its difficulties, and regain its former prestige.

The City Tire & Rubber Co., Canton, Ohio, shortly after its incorporation in October of last year, changed its name to The Hanner-Swanger Co., its officers being George S. Shaeffer, president; Fred C. Swanger, vice-president; C. A. Hanner, secretary-treasurer; and Walter R. Hanner, manager. The concern handles Goodyear solid and pneumatic tires and is distributer in Stark County for Kanton rims.

General offices of the Denman-Myers Cord Tire Co., formerly at 114 Engineers' Building, Cleveland, Ohio, have been removed to Warren, Ohio, where the company's plant is located.

Officials of the Marion Rubber Co., 55-57 Chestnut street, Columbus, Ohio, state that their business is now being carried on in their new five-story and basement building, and that they are in a better position than ever to serve their customers. This firm, which deals in rubber boots and shoes, Keds, etc., has sales offices at Marion, Indiana, and Detroit, Michigan. Officials of the company are: G. P. Butterworth, A. P. Butterworth, and H. W. Lushey.

The Rubber Products Co., of Barberton, Ohio, continues to report excellent business in its druggists' sundries line, the company's principal business. During the greater part of December the company operated a night shift in this department to meet orders. Tire production has shown very little increase during the past few months, however.

E. H. and R. M. Trump, formerly in the Excel Rubber Co., Wadsworth, Ohio, have leased the former Denmead Rubber Co. plant in East Akron and have started the production of belting and other smaller rubber goods. The plant was previously leased by the Horrocks Rubber Co., organized by A. C. Horrocks who has given up his lease and will probably join the Seiberling Rubber Co.

The Rubber Trade in the Mid-West

Mid-West Rubber Manufacturers' Association

The regular monthly meeting and luncheon of the Mid-West Rubber Manufacturers' Association was held at Hotel Morrison, Chicago, Illinois, December 13, with a good attendance. Thomas Fallon, president of The Lion Tire & Rubber Co., La Fayette, Indiana, presided in the absence of president W. W. Wuchter.

G. W. Brown, of The Consulting Co., Cincinnati, Ohio, was the principal speaker and gave a very interesting talk on the present situation in the rubber trade. He declared that the elimination of tire mileage guarantees is one of the most important steps ever taken in the rubber industry and it will eliminate much misrepresentation from which the trade has suffered at the hands of unscrupulous dealers.

General discussion followed concerning yarns and fabrics most suited for tire making. Competition at present prices for material is particularly difficult to meet and the general opinion

was expressed that tire manufacturers must forego profits and look to the future rather than sacrifice quality.

Miscellaneous Mid-Western Notes

Among the mid-western companies which have built up a flourishing business in comparatively short time is the Blekre Tire & Rubber Co., with factory and general offices at Vandalia street and Wabash avenue, St. Paul, Minnesota. Incorporated in 1917, this organization began operating as tire jobbers, but with the rapid growth of trade, found it necessary to establish a plant of its own, where tires and tubes could be manufactured to meet the increasing demand.

The factory is of steel, concrete, and brick construction, and with a total floor space of 82,000 square feet. It is said to be one of the best-equipped plants in the Mid-West, and every attempt has been made to secure healthful working conditions, while the welfare of the employes has been carefully considered. The executive personnel includes the following: E. O. Blekre, president; S. E. Blekre, vice-president and treasurer; George O. Ludcke, secretary and sales manager; F. G. Bean, superintendent; and E. L. Larson, assistant superintendent.

The Blekre Tire & Rubber Co., St. Paul, Minnesota

The recent appointment of Edwin B. Tozier as district manager for the Republic Rubber Corporation's Chicago territory, has been announced. Mr. Tozier has had more than twenty years' experience in the rubber industry, having held the following responsible positions with well-known companies: manager of the Cincinnati and Minneapolis branches of the Diamond Rubber Co., district manager of the United States Tire Company's Minneapolis and Chicago branches; and later affiliated with the General Tire & Rubber Co., Akron, Ohio, as general sales manager. Mr. Tozier will have his headquarters at Chicago.

As a result of increasing business The E. L M. Tire & Rubber Co., Racine, Wisconsin, is finding it necesssary to enlarge its present plant, and another building, 130 by 80 feet, of brick and stone construction, will soon be added to the company's plant. Business for the new year also appears promising for the specialties manufactured: rubber heels and molded goods. O. W. Dunham is secretary.

A recent appointment is that of R. W. Lyons as sales manager of The Lomer Armored Tire Co., New Castle, Indiana. This company reports increasing production, and is now making fabric tires in various sizes at the rate of 225 a day, while equipment has been ordered which will increase the present production of steel cord tires. This type of casing will soon be made by machine instead of by hand, the equipment having been devised by the Lomer company.

Plans for enlarging not only the main factory of the Elgin Rubber Ace Co., Elgin, Illinois, but also subsidiary plants, are being completed. At the Elgin factory 100 to 150 inner tires a day will be made, while sales or manufacturing contracts with connected companies will bring about a daily increase of several hundred more. The products of the Elgin Rubber Ace Co. are inner tires made of sponge rubber, and so formed as to furnish a shock absorbing cushion.

A capital increase of $500,000 has been recently announced by the Towar Consolidated Mills Co., Niles, Michigan. This organization was established a year ago for the purpose of acquiring the common stock interests of the Towar Cotton Mills, Inc., and the Acme Belting Co., Niles, Michigan, and the Towar Textile Mills Corporation, Toledo, Ohio.

The Rubber Trade on the Pacific Coast

Manufactured Goods

Except for a slight easing up caused indirectly by the mid-winter holidays, the rubber trade on the Pacific Coast has of late been excellent. The slight slackening is marked most in druggists' sundries, to a lesser degree in mechanicals, but not at all in tires, which are still going strong. Jobbers and smaller dealers are taking advantage of the exceptionally low prices, and manufacturers' agents are advising them not to delay purchases in the expectation that still lower prices may come. Buyers are told that tire prices have surely struck bottom and the next move will be upward, early in the spring.

One of the largest tire manufacturing concerns in the country is busy night and day at nearly all its coast branches making deliveries of tires bought on a three-months, no-interest plan since November 1.

Under this arrangement buyers do not have to pay the first instalment until March 1, 1922. A discount is offered for earlier payments. Smaller companies, which must discount customers' acceptances, instead of being able to finance the buyers, find themselves at a decided disadvantage.

A generally good report is made by the shoe trade. An excellent business is being done in the Northwest in rubber boots and rubbers, and for the same goods there is a steady demand farther down the coast for oil, mining and general construction work. Deliveries on large orders for rubber and canvas shoes begin this month, some of the storerooms here of the big Eastern rubber companies being taxed to capacity.

The manufacturers of various types of inner or "flap" tires and "outer tires" have recently reduced prices 15 to 20 per cent in keeping with the reduction on the prices of most new standard tires. But few other rubber goods, however, have been subjected to price reduction.

San Francisco

According to J. B. Brady, general manager, Pacific Coast division, United States Rubber Co., who recently presided at a conference of the company's Coast managers, the year 1922 holds forth exceptionally bright trade prospects. Every branch of the company's business has scored a gain over 1920, the tire sales for 1921 being especially large. The sales organization has been considerably strengthened throughout the Coast territory, and the managers are adding several new lines of goods that they are confident will prove very popular. Mr. Brady spent several days last month studying conditions in the southern part of California.

Full time in all departments, and overtime in some, is the report from the Pioneer Rubber Works, 68 Sacramento street, San Francisco. The mills are in Pittsburg, Contra Costa County, and are steadily being extended. A large unit was added during 1921, and another is projected for this year. The company has not only been doing a large business in belting, packing and other mechanical rubber goods, but has been running particularly strong on fire and garden hose.

Jelly Electrolyte Battery Co., Philadelphia, Pennsylvania, manufacturer of storage batteries, is planning to build a $250,000 branch factory at Berkeley, California, and also one in Manila, P. I. The president, H. E. Robinson, has recently been studying west coast conditions.

Charles T. Wilson, president of Charles T. Wilson Co., Inc., importer of crude rubber, 56 Wall street, New York, who has large trade interests in the Far East, has been making a study of the rubber trade on the Pacific Coast. He has been visiting Los Angeles, San Francisco, Seattle, and other important points and is very optimistic on trade conditions throughout the country generally.

Philip O. Deitsch is now one of the branch managers of The Mason Tire & Rubber Co., whose main offices are at Kent, Ohio. Mr. Deitsch will have his headquarters at 184 Second street, San Francisco, California.

Los Angeles and Vicinity

James F. X. Kennelly, advertising and sales promotion manager of the Goodyear Tire & Rubber Co. of California, Los Angeles, returned recently from Akron, Ohio, where he spent a month with the parent Goodyear company. He was gratified to find a marked improvement in the business of the Los Angeles concern, and quite in line with the big plant in Akron, which he reports is in a better condition than ever.

Roy R. Meads, president and general manager of the Pacific Rubber Co., Los Angeles, has returned from a three weeks' eastern trip during which he visited the C. Kenyon Co.'s plant in Brooklyn, New York, and the Horseshoe tire plant of the Racine Auto Tire Co., Racine, Wisconsin. The Pacific company, which has long handled the Horseshoe tires, has recently been appointed West Coast distributer of Kenyon tires.

The B. F. Wade Co., 2530 Santa Fe avenue, Los Angeles, is meeting with much success in introducing its latest product, the Wade tire chain, which is really not a tire chain at all. Instead of having chains in contact with the road to avert skidding, the Wade device has flat rubber and fabric straps, which are fastened to side chains which grip the tire and wheel circumferentially. The motor vehicles of the Los Angeles fire department are being equipped with the new device.

George R. Eno, president of the George R. Eno Rubber Co., 1026-1032 South Los Angeles street, Los Angeles, who has been president of this concern since its organization, has withdrawn from active management of the company on account of impaired health and former secretary, Roy R. Musser, has been chosen to succeed Mr. Eno, who is still chief stockholder. G. K. Norton has become secretary and treasurer, and Roy S. Madden vice-president. It is stated by the company that it has no intention of moving to Torrance, California, as had been reported in local trade circles, although it needs more room.

It is stated that one carload of insulated wire every five days is the output at the new plant of the California Wire Co., which has just been established at Orange, California. Operations were begun with 25,000 spools of cotton yarn shipped from La Grange, Georgia, and three carloads of copper. Three carloads of machinery have already been set up, and other special machinery is en route from Reading, Pennsylvania. Louis Koth is president of the company.

With a large number of orders in hand, the National Airless Tire Co. is hurrying the completion of its plant at Norwalk, California. Plans call for three stories, but the company will instal machinery as soon as the first story is finished. The tire, which was described in THE INDIA RUBBER WORLD December 1, 1920, page 183, is the invention of C. H. Braden, of Hollywood, secretary and production manager, with offices in the Grosse Building, Los Angeles.

The Pacific Balloon Co., 186 Blaine street, Riverside, California, of which H. A. Dodge is president, recently finished for a chain of department stores one of the largest orders ever given for toy balloons. The company, which has one of the best-equipped dipping plants in the West, has been executing orders for a considerable quantity of inflatable novelties for advertising purposes.

Southwestern Notes

The best estimate made thus far on the 1921 cotton crop in California—largely short-staple—is 130,000 bales, scarcely 50 per cent of the 1920 yield. During the ensuing year it is expected, however, that the acreage will be about doubled and a crop of 300,000 bales produced, which may keep prices within reasonable range. To this may be added an Arizona crop of 200,000 bales—largely long-staple—making a total of approximately 500,000 bales for 1922. Even this leaves out of consideration the San Joaquin Valley, where it is likely that a very large acreage will be put in cotton this year on account of the better prices being paid for the staple.

Wayne Compton, assistant sales manager of The Spreckels "Savage" Tire Co., San Diego, California, has been spending much time lately in the Rocky Mountain States, establishing what the company expects will prove important branches. The company reports a strong demand for its new all-black cord tire, and the big plant is working at practically full capacity.

Northwestern Notes

Several Pacific Coast rubber manufacturers are hoping to get a share of the big trade with Siberia which Washington D. Vanderlip's syndicate is arranging to open up in the 400,000 square miles of territory virtually ceded to the American syndicate for industrial development by the Russian Soviet Government. Mr. Vanderlip's office will be in Seattle, and from that point it is expected a great quantity of tires, rubber and other goods will be shipped across the Pacific.

The new plant of The Montana Cord Tire Co., Great Falls, Montana, which is ready for operation has a total capacity of 300 tires a day and will employ approximately 150 men. Capitalization of the new company is $1,000,000. The officers are H. T. Senay, president; J. R. Swan, secretary-treasurer; Edward N. Davis, first vice-president; and P. E. Welton, president of the Akron Engineering Co., second vice-president. The plant was built by the Akron Engineering Co., which will have charge of production for two years. All machinery is operated by direct motor drive and is electrically controlled, being one of the few small rubber companies so completely equipped.

A. Warren Gould, president of The Natural Fire Proof Lumber Co., Mt. Angel, Oregon, is visiting eastern rubber mills to introduce the new compounding material Tuffite.

POWDER REPLACES CEMENT IN TIRE REPAIR

In repairing tires, where tire bands—tread and sidewalls—are to be placed over old casings, the use of cement in powder form has proved most efficacious. The powder, brushed over the old tire, melts in the process of vulcanizing and cures the tire band to the casing perfectly. The George W. Eno Rubber Co., 1026 South Los Angeles street, Los Angeles, California, claims the invention of this process and is making use of it in the application of the company's "Exo" tire bands.

WITH THE RECENT INSTALLATION OF ADDITIONAL EQUIPMENT The Tiger Tire & Rubber Co., Limited, 81 Adelaide street, West, Toronto, Ontario Canada, is now in a position to produce 450 tires daily. Officials of the organization state that they have just completed a very successful season, and that the outlook for 1922 is also most encouraging. The company's factory is at Belleville, Ontario.

The Rubber Trade in Great Britain

By Our Regular Correspondent

Lancashire Strike Settled

THE Lancashire rubber workers' strike, referred to last month, did not last long and an agreement was reached in the following main terms:

1. The standard week to be 48 hours, that is, one hour additional, the pay to be the same as for 47 hours.

2. A reduction of wage at the rate of 7½ per cent on total earnings.

3. Minimum rates for men 48*s*. per 48 hours. Minimum rates for women, 25*s*. per 48 hours.

Owing to the recent fall in the cost of labor a reduction in wages was certainly justifiable, especially in consideration of the existing stagnation in trade. At a later date further discussions are to take place with a view to harmonizing pay with possible alterations in the cost of living.

Business Unevenly Distributed

The welcome spurt in the proofing branch had only a comparatively short life and things have quieted down again. With regard to other branches one cannot generalize; one firm may be busy and another slack. A rubber heel maker tells me he has work for 24 hours a day, but it is quite possible that his competitors are not all equally busy. With respect to proofing for the trade, it is mostly hand-to-mouth working and there is keen cutting of prices, as the minimum price-list issued some time ago by the Rubber Manufacturers' Association has now been withdrawn. The problem is to keep machinery going full time, and in order to effect this, work is being taken which will barely cover running costs. An announcement in the chemists' shops that one shilling will be paid for old hot-water bottles is a novel one and there is some speculation as to its inner meaning. If I may hazard a guess I imagine that it must be meant to encourage the purchase of new ones as likely to be more reliable, because as scrap rubber there can hardly be a great demand at the price.

Institution of Rubber Industry

The inaugural meeting of the Manchester Section was held on November 7, and in the absence of Sir Charles Mandleberg, his son, J. H. Mandleberg, presided in a very efficient manner. Apparently there were about 150 present, including many who had received cards of invitation but were not at the time members of the Institution. The absence of most of the leading North of England manufacturers was commented on in a speech by Captain Ernest E. Buckleton, though in addition to the chairman the St. Helen's Cable & Rubber Co., Limited, and the Northern Rubber Co., Limited, of Retford were represented.

Sir Charles Mandleberg, in a letter to the secretary, said that one great advantage of such an institution was its tendency to become a sort of sounding board for every development in the industry, whereby its members would benefit. In time it should become a valuable clearing house of ideas on the subjects appertaining to the rubber and allied industries and its annual and other meetings would be useful for recording and measuring the progress made.

The Chairman's Address

The chairman in his opening speech had a tilt at the proverbial secrecy of the rubber manufacturer who jealously guards his own mixings and methods. The technology of rubber, he said, is probably the most difficult in the world and it is desirable that the various scientists who are working on these problems should be informed at the meetings regarding the requirements of the trade. Many chemists are devoting themselves to the study of that most difficult substance, rubber, which often presents almost insuperable difficulties, and therefore they should be encouraged to work in harmony and cooperation.

The chairman spoke of the great service rendered in the inception of the planting industry by Sir Henry Wickham and read some extracts from his book. At their conclusion Dr. H. P. Stevens read his paper on "Plantation Rubber: Effect of Different Methods of Preparation on Its Behavior in the Factory."

Dr. Stevens on Plantation Rubber

The old subject of the difference, or alleged difference, between Brazilian and plantation Pará came under treatment without any particularly novel facts or contentions being put forward. With regard to the variations in plantation rubber Dr. Stevens pointed out that about one-quarter to one-third of Malayan rubber comes from small Chinese holdings and is milled in Singapore, and is bound to show variation. It has been suggested that plantation rubber be sold by brand, but the dealers are against this as it prevents them from filling particular orders by mixing consignments from different plantations. He referred at some length to the demand for pale crêpe which has to be specially prepared with bisulphite, though it is really no better than the dark-colored rubber. Mould also, he said, has no bad effect on the rubber, though it is looked at suspiciously by the manufacturer. With regard to the use of bisulphite, he wished to emphasize the fact that it is not used in bleaching rubber which has become brown; its effect in the very small proportion in which it is used—1 part to 800 parts of latex—is to destroy certain extraneous matters which are the cause of the darkening of the rubber. No doubt during the war some inferior chemicals or substitutes were used in coagulation, but that is now all over. He thought that variability in the rate of cure had been largely overcome in the United States and Canada by the new organic accelerators which are used to a much greater extent than in England. It is obviously impossible to test every sheet of rubber or even every case, but if a machine is available it can be batched and a test vulcanization made on a sample.

The Discussion

Sir Henry Wickham, who was invited by the chairman to open the discussion, spoke chiefly of the advantages he thought would accrue to the trade from having a hard cure plantation rubber of a uniformity equal to the Brazilian product. It is said that the Wickham hard cure process produces a standard product which does not vary.

Mr. Fanner, who spoke from his Ceylon experiences, deplored the slack manner in which chemicals are used on the plantation, though he understood that there is closer supervision now. In the case of electric cables the use of plantation had been long delayed because no reliance could be placed on the results. Even now efforts are made to use always rubber from one plantation.

Mr. Brooking thought that Dr. Stevens had not gone sufficiently into the details of what manufacturers require. Under present conditions they have to make test upon test to insure that their goods are not going to be returned and they would welcome further guidance as to procedure. Mr. Gray contended that the root of the matter is that they are not getting a standard rubber because the methods on plantations are not standardized.

Dr. Stevens read a paper under the same title at a London

meeting of the institution held on November 16, and there was again a long discussion. On this occasion the chair was taken by Sir Frank Swettenham, G. C. M. G.

Rubber Linoleum

The new propaganda department of the Rubber Growers' Association has recently addressed a circular letter to rubber manufacturers on the subject of rubber linoleum. The letter states that a great demand has been created for the linoleum and the difficulty now is to get it, as at present only one firm is in a position to deal with orders. As the Association proposes to advertise the rubber linoleum at its own expense—the object being to increase the demand for rubber—it is asking rubber manufacturers to send in details of their product with price, samples, etc. This is being done so that the Association may not be accused of booming any one particular manufacturer, though the letter has been sent not only to those firms which may reasonably be expected to be in a position to make the article but also to those which have no facilities whatever for engaging in the business.

The members of the propaganda committee announce themselves as being in readiness to discuss the matter with the directors of rubber manufacturing firms or their representatives. Inquiries on the subject, it is stated, are not confined to this country only, but also emanate from the Continent and the Colonies, particular interest having been aroused in the United States. Only one firm is said to be now supplying this rubber linoleum. At the moment the writer cannot say whether the material called kamptulicon is still being made in the east end of London as it was 30 years ago, but this was a linoleum containing rubber, and patents have been taken out this year for flooring compounds of vulcanized rubber and wood meal.

Financial Notes

For the period ended August 31 last, the accounts of the India-Rubber, Gutta Percha & Telegraph Works Co., Limited, show a loss of £445,461 against a profit last year of £73,300. There is no dividend and the carry-over of £35,498 is derived from the last sum of £350,000 brought in from reserve. Twice in the last ten years the company has had an adverse balance, though to nothing like the same extent, but there is no reason to believe it will not recover its dividend-paying position when trade revives. A loss of this sort which, of course, is largely due to depreciation in the value of stock, naturally invites speculation as to the position of other large rubber undertakings which are in private hands and therefore do not publish their accounts. The general impression seems to be that they can but be in much the same position.

The Palmer Tyre, Limited, an offshoot of the above firm, has a more satisfactory result to show, a profit of £7,613 being recorded. The dividend is 10 per cent. free of tax.

Rubberine, Limited, which did quite well during the war, has since had a financial collapse and the plant and machinery at the works off Caledonian road, London, N., have been sold at auction. As there are one or two other concerns with somewhat similar titles, it may be said that Rubberine was an oil substitute which contained a large amount of mineral matter.

Reproofing Raincoats

Among some of the public the idea has always existed that an old macintosh can be rewaterproofed whereas, of course, this is not the case. With raincoats, however, the case is different, though it has not been customary to rejuvenate old garments. Recently J. Halstead, Limited, of Whitefield, Manchester, has opened a department for cleaning and reproofing raincoats and has had a good deal of business to do in this direction.

The Rubber Trade in Europe

By Our Regular Correspondent

France

The affairs of Appareillage Electrique Grivolas, Paris, are reported as not being satisfactory. The company is capitalized at 7,500,000 francs and during the past business year could show net profits amounting to only 62,395 francs. Consequently no dividends were declared. For the previous year net profits were 990,000 francs and a dividend of 10 francs a share was paid. At present, stocks of raw materials and merchandise to a value of 8,960,000 francs are on hand, that is, about twice as much as the year before. It is feared that it will not be possible to clear stocks without loss and also that the large sums due the concern will not be recovered in full.

The Manufacture Parisienne de Caoutchouc, Paris, is in liquidation and for the present the factories are being exploited by a consortium of liquidators organized under the name "Syndicat Provisoire de l' Exploitation de la Manufacture Parisienne de Caoutchouc."

The factories of Prouvy-Thiant, near Valenciennes and Javel, are working normally and carry out orders for account of the postal automobiles and the municipal street-sweepers. Their specialty is the manufacture of the Ducasble pneumatic tires of which the company acquired the patent. The firm also has factories at Halluin, Nord, Ménin, Belgium, and a hydroelectric factory at Froges, Isère. The latter was partly destroyed by fire recently. La Manufacture Parisienne, which has considerable credit with the Government, will very shortly be resumed by a group at present in formation and will have a fairly considerable capital. The principal liquidators are interested in the new company now being organized.

Holland

Recently something of a panic prevailed in the Amsterdam rubber market, due to various causes, chiefly to the fact that the bad conditions in the East were considerably exaggerated.

The news that the new Governor-General in Java intended to continue the plans whereby a considerable portion of the profits of agricultural concerns in excess of 6 per cent should be diverted to a fund to benefit the native population, made an unfavorable impression on the Amsterdam exchange.

Further declines in the market followed when it became evident that nothing would come of the schemes for compulsory restriction of rubber.

However, as news about the Dutch rubber companies in the East became more favorable, a reaction set in and now, following reports of several companies which had made forward contracts at reasonable prices, the market has become increasingly firm. The shares of the Amsterdam Rubber Co. have risen to 110 per cent and the shares of other rubber concerns are following the upward trend. The Amsterdam company is one of those fortunate concerns lucky enough to have made forward contracts at high prices. In the spring of 1920, it sold 1,900,000 half-kilos out of the 1921 crop at 2*s.* 5*d.* f. o. b. India and 1,200,000 half-kilos out of the crops 1922, 1923 and 1924 at 2*s.* 10*d.*, also f. o. b. India. At the present time, many transactions have been made at the Amsterdam market at prices varying between 55 and 58 gilder cents per half-kilo, and for 1922 56 and even 58 cents per half-kilo were easily obtained.

German Competition

The effect of German competition has been keenly felt but circumstances point to a change. Up to the present time local dealers have been placing orders with German rubber manufacturers because they could secure good bargains owing to the fact that not only did the rate of the mark favor them, but also Germans were keen to profit by this and push their wares, even

if they had to content themselves with a smaller profit. This, of course, adversely affected local manufacturers who have been complaining about the difficulty of disposing of their products in the face of German goods.

Now, however, the mark has dropped so low that German manufacturers are thinking of exacting part payment for their product in gilders at a higher rate than that prevailing. The Dutch manufacturer is fervently hoping that this may take place for then the German goods would hardly be good bargains and the Dutch dealers would prefer to pay a little more for the home product in order to secure delivery at an agreed, fixed price.

The following example shows what the rate of the mark has done to prices, even when the latter have been very much increased. A kilo of rubber gas tubing cost 2.40 gilders before the war, whereas, a kilo of the same quality can now be bought for 45 gilder cents. A normal gilder equals $0.40 U. S. currency.

Rubber Trade in 1920

During the first part of 1920 the rubber industry in Holland was in a favorable position but later on this changed. On account of exchange rates, Dutch goods were too expensive for most countries, whereas in other countries import prohibitions and restrictions hampered trade. On the other hand, England, France and Germany took advantage of their low rates and sent large quantities of tires and sanitary and technical rubber goods into Holland. In fact, competition, especially in technical rubber goods, was so severe that several manufacturers of the latter class of goods had to close down. During the last few months, only the Netherlands East Indies took significant quantities of Dutch rubber goods.

The imports and exports of rubber manufactures were as follows:

	Imports		Exports	
	1919	1920	1919	1920
Automobile tire covers.....*number*	69,760	81,332	6,164	7,806
Automobile tubes	53,037	64,780	2,641	3,263
Motorcycle tire covers	23,701	20,239	147	892
Motorcycle tubes	21,404	14,758	146	1,292
Bicycle tire covers	972,610	755,001	12,062	170,146
Bicycle tubes	796,271	632,968	21,725	62,988
Solid tires	3,202	6,338	111	122
Other rubber goods.....*kilos*	457,345	933,581	37,158	51,766

The automobile tires came chiefly from the United States, the other articles mainly from England.

Denmark

The A. S. Den Danske Kabelfabrik (The Danish Cable Works, Limited), Copenhagen, it is understood, intends to go into liquidation. This concern was established during the war with a capital of 3,000,000 kroner. For some time past production has been stopped, owing to the difficulty of placing the output.

The liquidation of the A. S. Harders Gummifabrik has ended. Shareholders get nothing but it seems that creditors are fully covered.

Germany

Some months ago it was recorded in these columns that although the outsider might regard the conditions in Germany as rose-colored, conservative and thoughtful German business men were not very optimistic about economic affairs in their country. The present situation, however, apparently indicates that Germans of the above type are decidedly pessimistic. While there are millions of unemployed in other countries and production has been curtailed, German factories are working to capacity. In fact many manufacturers have had to turn down orders and in other cases delivery has been postponed indefinitely. In the rubber industry, technical, surgical and sporting goods, toys, footwear and waterproof clothing are in great demand. In short there is a real boom in many industries including the rubber industry. No cause for pessimism, one would say.

Under the surface, however, this is not healthy activity based on sound conditions, but a feverish desire to convert paper marks into merchandise, plus the inevitable amount of speculation. What has been happening is this: The continued fall of the mark and the steady rise of many raw materials in foreign countries have resulted in prices of raw materials doubling and trebling to Germans within the last few months. Then the cost of labor increased and manufacturers found it necessary to advance prices.

In the rubber industry values have risen from 50 to 250 and 300 per cent on various kinds of goods. As prices moved upward, buyers began to stock up with goods to avoid buying at top-notch rates. It is feared that the inevitable reaction—a practical consumers' strike—will set in, bringing with it cessation of production, widespread unemployment and general stagnation.

But this is not all. There is a good deal of underselling despite repeated warnings against this practice. A writer in the *Gummi-Zeitung* points out that the more Germany works, the poorer she becomes. As her exports increase, owing to overproduction, the greater are the gratuities offered by Germany to foreign countries. For Germany must pay a high price for raw materials, while the manufactured goods are accumulating in foreign markets and find no buyers. Thus, the more that goes out of the country the less that returns, and the end, as the above writer foresees it, is economic disaster, not only for Germany, but for other countries as well.

Prices Are Advanced

The increases in prices of surgical hard and soft rubber goods recently announced have been revoked and new prices made. Thus, all seamless rubber goods will be 50 per cent higher; all other hard and soft rubber goods are advanced 33⅓ per cent; bathing caps and sponge containers are 10 per cent higher. Special rules are to be conformed to by exporters.

On September 6, 1921, an increase of 80 per cent in gutta percha articles was announced. Instead of this, a new rate has been announced which is 250 per cent above that prevailing before September, 1921.

Soft rubber technical goods are 30 to 50 per cent higher instead of 10 to 20 per cent as was at first decided. Dry packing has had 30 per cent added to the usual price, and oiled and similar packing, 20 per cent. Rubber belting is 36 per cent higher.

Tires of all kinds have gone up 45 per cent. The Foreign Trade Bureau for the vehicle industry has decided that exports of bicycles, baby carriages, and parts thereof, to countries with high rates of exchange, will be permitted only when it is agreed that payment will be made in the currency of the country of destination. Similar rulings will shortly be enforced for motor vehicles and parts thereof.

All increases noted are subject to change without notice.

The upward movement of prices will best be understood when it is known that first latex crêpe, which on April 30, 1921, was quoted at 26.75 marks and was about the same price in September, rose to 40 marks by October 1 and to 80 marks by November 1. American cotton was 24.50 marks on April 30, 1921. By September this had become 45.30 marks; on October 22, the price was 94.70 and on November 5, 112 marks. One effect of the present situation has been a revival in the waste and reclaimed rubber trade.

German Notes

The firm "Vulkan" Gummiwarenfabrik Weiss & Baessler, Grossenhain, has been dissolved and a newly formed stock company takes its place. This company, Vulkan Gummiwarenfabrik Weiss & Baessler, Akt.-Ges., Zweigniederlassung Grossenhain, Grossenhain, Saxony, is a branch of the firm of the same name established at Leipzig. The main concern was recently reorganized and has a capital of 4,000,000 marks.

Gummi-Handelsgesellschaft "Liga" Balkwitz & Co., Berlin, has been dissolved.

The Berlin wholesale surgical rubber goods business and bandage factory, carried on under the name of A. Baumert-Export since 1859 has been sold to A. Wellenstein, E. Singer and G. Roth.

The Norddeutsche Gummi- und Gutta-perchafabrik, formerly Fonrobert & Reimann Akt.-Ges., Berlin, intends to increase its capital to 10,000,000 marks by the issue of 4,000,000 marks of new shares.

The Hannoversche Gummiwerke "Excelsior" A.-G., Hanover-Limmer, has decided to double its capital which will now be 20,000,000 marks. The company's business at present is excellent, and the firm can hardly satisfy the demands of its customers. However, Director Siercke considers that the present boom is abnormal and foresees a reaction, especially as there is overproduction in certain rubber articles.

The Leipziger Gummiwaren-Fabrik, A.-G., formerly Julius Marx, Heine & Co., Leipzig, proposes to increase its capital by 4,300,000 marks, thus bringing it to 5,500,000 marks. This company's stock was quoted at 1200 on the Leipzig exchange on October 26, 1921.

New Firms

Medhycos, Gesellschaft zur Fabrikation und zum Vertrieb hygienischer Artikel m. b. H., Berlin; manufacture and sale of hygienic articles, especially the manufacture and sale of a rubber sanitary bandage.

Leo Hartmann, Berlin; wholesale dealer in gutta percha and rubber technical and surgical goods and insulation material; manufacture of the Momburg flat-foot sole; exclusive selling rights for the Momburg compression tube.

Dankwart-Recke Weltgummi-Absatz-Gesellschaft m. b. H., Berlin, has been formed to manufacture and sell a new exchangeable rubber heel, Dankwart-Recke.

Universal-Absatz-Industrie Otto von der Schlippen & Co., G. m. b. H., Bonn; manufacture and sale of rubber and leather heels.

Heliosit-und Gummiwerk Einbeck, G. m. b. H., Einbeck; manufacture and sale of articles of rubber, imitation resin, etc.

Vulkanisator, G. m. b. H., Hanover; manufacture and sale of rubber solution.

Rudolf Freysinger, Munich, and S. Gens have formed a new commercial enterprise for Eastern Europe under the name, S. Gens & Co., Warsaw, Poland, with offices in Warsaw and Danzig, and branches in Poland and Lithuania. This firm will be general sales representatives in these countries for the Continental Caoutchouc and Gutta Percha-Compagnie, Hanover.

Until Russia is ready for German trade, Mr. Freysinger will direct the buying and business relations with the different factories from Munich, while Mr. Gens will take charge of the selling in Poland and Lithuania.

Kabelwerke St. Vit Aktungesellschaft, St. Vit; manufacture and sale of electric wires and cables.

Austria

The Steirische Gummihandelsgesellschaft m. b. H., Vienna, is a newly formed branch of the main business in Graz. This firm will deal in all kinds of rubber tires and technical rubber goods on a commission basis.

DUNLOP RUBBER CO. OF AUSTRALASIA, LIMITED

The first balance sheet of The Dunlop Rubber Co. of Australasia, Limited, which was formed in July, 1920, to take over the business carried on by a company with a similar title, shows a net profit of £149,162. The directors of the company, now recommend a dividend of 5 per cent for the second half of the year on the preference shares, and 3 per cent for the last six months on the common. The nominal capital of the organization stands at £3,000,000 in £1 shares.

DURING THE FIRST SIX MONTHS OF 1921, JAPAN IMPORTED CRUDE rubber to a value of 9,066,000 yen, against 10,396,000 yen during the corresponding period of 1920. A yen equals about $0.50 at normal rate of exchange.

The Rubber Trade in the Far East

By Our Regular Correspondent

Malaya

The optimistic tendency continues and there are those who think the time not far off when rubber will sell around 45 to 50 cents a pound, Straits currency. The market here is comparatively active, a recent feature being the readiness with which lower grades of rubber found buyers. In spite of this, it may be said that the position of the average planter remains practically unchanged.

Effort to Combine

For some time past, local producers had felt that it was absolutely necessary for European and Asiatic planters to combine if anything was to be accomplished in the way of controlling output. But very little was done to bring Asiatics, and more especially Malays, into line with the Europeans. As has often been said, these Asiatic planters have very small holdings, generally between 25 and 50 acres, rarely over 50 acres. However, there are so many of these little plots, each tapped to the limit, that the total output amounts to quite a respectable figure.

At a recent meeting held at Kuala Lumpur it was decided to try to organize local dollar rubber companies and individual owners of rubber estates into an association which would cooperate with other efforts to protect the rubber producing industry. For some time there has existed what is known as a Dollar Association in the Rubber Producers' Association of Malaya, with headquarters in Singapore. This body represents 250,000 acres, has a membership of 122 companies, of which 112 are locally registered, and 10 individuals. It is said that there are 133 proprietors, so that the 10 mentioned above form only a small part of the individuals who should be in the Association to insure success for its efforts.

Costs and Yields

When looking through reports of rubber companies, one of the things that immediately attracts attention is the frequent heading, "Reduced Costs." In some cases estates are shown to be producing as low as 21 cents all-in. A reduction in costs of 2 to 3*d*. a pound over those for the year before.

The report of the Cicely Rubber Estates shows that to the end of June, 1921, f. o. b. costs amounted to 24.26 cents a pound against 36.56 to the same date of 1920. The actual f. o. b. cost for June itself was only 21.75 cents, compared with 37.71 cents in June, 1920. This economy has been brought about without neglect of the property, which is in as good a condition as ever. Alternate day tapping is the rule and tapping costs are under 6 cents a pound. By selective tapping it is hoped to reduce the tapping rate still further and bring it as low as 4 cents a pound.

The oldest trees on this estate, planted in 1898, had been abandoned for three years. But apparently this did them no harm, for today they yield 9 pounds daily and that on alternate daily tapping with one cut on a quarter of the tree. Seeds from Cicely Estate still maintain their reputation and during the past year brought in £1,962. Forward contracts helped to give the company a small profit, £1,721, which with the previous years' carry-forward of £10,543 shows £11,964 to the credit of profit and loss account.

Costs with the Kedah Rubber Co. were 38.69 cents (10.83*d*.) a pound. Of this 7.4 cents came under the head of tapping. The daily single quarter cut is followed and the average yield per tree 4.28 pounds per annum.

The Sungei Bagan Rubber Co., Limited, reports all-in costs of 41.44 cents a pound. Profits amounting to $27,450 were made on rubber contracts. During the first half of the past business year, the company made forward sales covering 36 tons at an average of 84 cents a pound; and for the second half, forward sales amounted to 12 tons at 106 cents. Since December, 1920, this

company has pursued a policy of no tapping and keeping the estate in first class order. This involves a monthly cost of $3,500.

Labor

It is well known that one of the chief handicaps of the Malayan rubber industry is the lack of a cheap and adequate locally domiciled labor supply. Labor here consists mainly of Chinese and Tamil (South Indian) coolies. The Chinese are expensive, independent and know to perfection how to take advantage of supply and demand. On the whole, therefore, it has been found that the Tamil is the best kind of laborer for Malaya and large sums have been spent in recruiting them from their villages in South India.

The average number of adult coolies arriving in the Federated Malay States during the past twelve years is about 61,016 per annum. In 1919-20 arrivals exceeded departures by 90,661, and the total population at the end of the latter year was 160,966. The figures for the current year—totals for the last quarter only being estimated—are 16,100 arrivals against 41,398 departures. It is calculated that at this rate 18,277 more will have left by June, 1922. So that it is feared a serious labor shortage is threatening Malaya. From reliable reports it appears that the prospect of obtaining an adequate labor force when times become normal is not reassuring, and there is no doubt that the process of securing a sufficiency of labor in Malaya will be long, expensive and difficult.

Considering all things, employers are being urged to do all in their power to retain as many Tamil coolies as possible and to endeavor to preserve their recruiting connection in India. It has also been resolved to recommend to the Government the abolition of imprisonment for labor offenses.

Statistics

During 1920, the state of Johore exported 450,787 piculs—26,824 tons—of rubber against 468,631 piculs—27,890 tons—in 1919. This was 19.9 per cent of the Singapore exports, which amounted to 2,261,541 piculs. A picul is equal to 133⅓ pounds.

The total exports of rubber during the nine months ended September, 1921, amounted to 112,206.9 tons, value approximately $76,159,000. These amounts were distributed as follows: 24,430 tons, value $17,186,000, to England; 68,041.9 tons, value $45,339,000, to the United States; 4,066.4 tons, value $2,828,000, to Europe; 291.6 tons, value $222,000, to Australia; 130.5 tons, value $89,000, to Ceylon; 15,167.3 tons, value $10,445,000 to Japan; 79.2 tons, value $50,000 to other countries. During the same period of 1920 the totals were 137,553.7 tons, value $266,707,000 when 31,960.9 tons, value $58,169,000, went to England; 97,451.7 tons, value $193,510,000, to America; 3,852 tons, value $6,098,000, to Europe; 259.5 tons, value $412,000, to Australia; 166.6 tons, value $336,000, to Ceylon; 3,691.7 tons, value $7,894,000, to Japan; and 171.5 tons, value $288,000, to other countries.

These figures represent rubber imported into the markets of the Colony from all places locally produced and rubber transshipped from the Federated and Non-federated Malay States.

Malaya-Borneo Exhibition

It is announced that a Malaya-Borneo Exhibition is to be held here from March 31 to April 8, 1922, at the time when the Prince of Wales visits the colony. While the exhibition is intended to celebrate the occasion of the Prince's visit to these parts, another object aimed at is to bring Malaya and Borneo into closer contact. At the exposition will be represented the arts and crafts of both countries, minerals, agricultural products including rubber of course.

Rubber Paving Again

A new paving block has been invented by Lionel Cresson, chemist of the Netherlands Gutta Percha Co., Singapore. This block has a rubber surface about ⅜-inch thick vulcanized to a base of a very cheap hard material. The whole rubber surface is held firmly in place and there is no metal embedded in the rubber to become a source of danger if the rubber gets worn or cut.

The Singapore Harbour Board has granted a suitable site and will lay foundation for the patent sets. The rubber blocks are being made, it is said, by the Netherland Gutta Percha Co., in Singapore.

Rubber Census

A census of rubber will be taken throughout Malaya on December 31, 1921. All known producers of rubber will be served with a notice. Holders of less than one picul of rubber will not be included in the count.

Bud-grafting

At a recent meeting of the Kajang District Planters' Association, Major Gough read a paper on "Bud-grafting." He related his own experiences in this field, which in Malaya is entirely new. After many failures he at last succeeded and expects to complete the bud-grafting of at least 600 acres this year and more next year. The Dutch have been working in this direction for the last four or five years and it is considered high time Malaya took up the matter seriously.

Ceylon

The Select Committee of the Legislative Council appointed to consider the question of relief to the rubber industry has proposed a sliding scale of export duties on rubber so that the industry will be relieved when prices are low and will pay increasing rates when prices increase.

When the market price of first grade rubber is:

Price per pound	Duty per 100 pounds Rupees
Under 50 cents	1.50
50 cents and under 55 cents	2
55 cents and under 60 cents	3
60 cents and under 65 cents	4
65 cents and over	5

These duties will be based on the price prevailing at the end of each month which price will be accepted as that on which duty shall be paid for the entire ensuing month irrespective of fluctuations in price during the month.

This new sliding scale has caused grave dissatisfaction among those interested and it is felt that the old flat rate of 3 rupees per hundred pounds is preferable to this new scale.

The Colombo Chambers of Commerce have also drawn up a scheme for taxes on a sliding scale and it is interesting to compare this scale, the proposed government scale, and the system actually in use in Malaya.

DUTY IN CENTS PER POUND OF RUBBER

Price	Government Proposals	Chamber of Commerce	Malaya Duty
45 cents	1.5	Nil	Nil
50	2	1.25	Nil
55	3	1.25	Nil
60	4	1.80	Nil
65	5	1.80	Nil
70	5	2.45	Nil
75	5	2.45	Nil
80	5	3.2	Nil
85	5	3.2	Nil
90	5	4.5	4.5
95	5	4.5	4.75
100	5	6	5
150	5	...	7.5
200	5	...	10
250	5	...	12.5
265	5	...	15.9
300	5	...	18

Netherlands East Indies

Much interest is being taken at present in experiments in vegetative propagation of Hevea. Dr. P. Arens has given an account of the results obtained on four different estates where areas were planted with "gootee" layerings of Hevea. On three estates very satisfactory results were obtained. On one it was decided to plant only gootees in the future and no more stumps. On this estate it was found that trees from gootees after three years generally have thicker bark than trees of the same age obtained from stumps. Gootees can be tapped about six months earlier than trees from stumps and the yield is higher.

On one estate the results were very poor. Many trees toppled over and were lost. Others did not grow straight but leaned. This poor result was probably due to the heavy clay soil which is very hard when dry and very soft when wet.

In conclusion Dr. Arens said that gootees may be planted in a normal soil if the roots are well-developed before the gootees are planted in the field.

The manager of the Pasir Waringin Estates in Java, L. Tas, has taken up the propagation of Hevea with grafts and has a special garden planted with grafts from mother trees of the estate. The grafts are now 2½ years old and Mr. Tas is offering slips for sale.

At the Experiment Station of the Avros—East Coast Sumatra Rubber Producers' Association—gardens have been planted with Hevea grafts and the Experiment Station is now in a situation where it can deliver grafts on a modest scale. In 1922 it is hoped to be able to satisfy all demands. At present, however, not more than 250 meters of grafts can be supplied to one estate and companies which have cooperated with the station in the direction of grafting will enjoy preference. The 250 meters are enough for a garden of 2,000 to 2,500 grafted Heveas from which sufficient grafts can be obtained the following year to plant 500 acres more.

It is expected to be able to make deliveries of selected Hevea seed by 1923.

In the *Algemeen Landbouwweekblad voor Nederlandsch-Indië*, October 28, 1921, C. M. Hamaker reports some yields of trees obtained from selected seed, and growing at an elevation of 1,600 feet. There are 34 trees, the remainder of 301 one-year-old stumps from seed taken from the 1914 seed crop of high-yielding mothers and planted in 1915. The 34 trees are, therefore, 6¾ years old now and have a girth of 61.4 centimeters. Some of these yielded on October 19, 1921, as much as 38 grams of rubber per cut. One gave 41.80 grams; 12 gave between 25 and 36 grams per cut, and 12 from 15 to 22.80 grams per cut. These 34 trees, of which three were not tapped because they were sick, stand on about 0.7-acre of land and yielded 773.89 grams of rubber on one cut on one-third of the circumference.

Taxes

Much feeling has been aroused among producers by the proposed increase in taxes and particularly by the so-called *winst aandeelkassen*, a fund to which all excess profits over 6 per cent is to be diverted and which will be used mainly to benefit the native population. English, French and Belgian producers have protested against the proposed measures. The local press, too, is generally against the new plans and points out that investors will prefer to go to the French or English colonies where taxes are less prohibitive.

Netherlands Indies Notes

The Pirelli Tire Co., Milan, is reported to contemplate opening agencies of its own in the most important cities of the Netherlands East Indies.

The Société Internationale des Plantations et des Finances, Sumatra, is said to have taken over three estates from the Bila Rubber Lands Limited, namely, Tetoelang North, South and West. It has also bought the concession Ajer Merah which is destined for the cultivation of oil palms.

Papua

The directors of the Kemp, Welch River Rubber Estates, Limited, have announced that the fall in the price of rubber was responsible for a loss of £2,907 on last year's transactions. In the previous balance sheet rubber was taken at 1*s.* 8*d.* a pound and the company did not sell its crop. Meanwhile, the price has dropped to around 8*d.* a pound and naturally the board does not wish to sacrifice the rubber at this price The company holds 41,840 pounds of rubber valued at £1,046.

South India

The following figures were collected by the secretary of the United Planters' Association of South India with regard to restriction.

1921	Tapped	Not Tapped	No returns
January .....*acres*	9,046	23,405	10,921
February	.....	32,451	10,921
March	11,352	21,099	10,921
April	25,069	7,382	10,921
May	23,862	7,382	12,128
June	21,547	7,382	14,443

During the six months considered above, the actual crop was 1,136,715 pounds against an estimated normal production of 1,879,264 pounds. From January to August, 1921, a total of 2,182.37 tons was shipped from South Indian ports. From March to August 2,464,300 pounds were reported as shipped, while crop returns from January to June on about 30,000 acres were 1,136,715 pounds, showing an excess of shipments over returns received amounting to 1,327,285 pounds. The output returns are for January to June, while the shipping figures show exports from March to August. This is in order to make them more accurate in comparison, as January crops are not shipped much before March, and June crops until August.

The area represented by the association is 43,372 acres out of a total rubber area of 61,795 acres. Of the latter 36,018 acres are in Travancore, 13,900 in Madras, 8,784 acres in Cochin, 2,680 acres in Coorg, and 413 acres in Mysore.

Indo-China

The editor of the *Deli* (Sumatra) *Courant* recently paid a visit to Indo-China and inspected some rubber estates in the Thudaumot province.

He found several estates which, in spite of the high rate of the piaster are able to produce rubber sufficiently cheap to be able to make a profit. He visited some estates where the all-in costs per kilo were fifty cents. Among the advantages for the planter in Indo-China he found that the country is independent of other lands for the supply of rice so necessary for its labor; in fact hundreds of thousands of tons of rice are exported annually.

There is a sufficient supply of local labor and recruiting costs are only about $35. The wages for a male coolie are 40 dollar-cents a day and for a female worker 30 cents.

The soil is rich and the Government is doing a lot to encourage planters. Most of the uncultivated land is covered with a light growth of bamboo and shrubs, requiring less labor than new lands in opening up.

Another important advantage in Indo-China is that the planters do not have to lease the lands but own them outright. Moreover, there is no question here of the high taxes that have done so much to discourage new enterprises in the Netherlands East Indies. And of course there is no export duty on rubber. On the contrary, the Indo-Chinese Government has granted a bonus on every kilo of rubber exported, to help while the piaster is so high and the price of rubber continues low.

Exports

Official statistics for the first six months of 1921 show that the exports of crude rubber from Indo-China were as follows: from Cochin China a total of 1,759,296 kilos, of which 1,330,276 kilos went to France and 429,020 to other countries. During the first half of 1920 the total was 1,539,377 kilos. Annam exported 17,738 kilos against 8,376 during the first six months of 1920. During the former period 17,421 kilos were shipped to France and 317 kilos elsewhere. The totals for Indo-China were 1,776,034 kilos, of which France took 1,347,697 kilos and other countries 429,337 kilos. For the corresponding period of 1920 shipments amounted to 1,547,795. Altogether 3,553,068 kilos were exported during the first half of 1921 and 3,095,948 kilos in the same period of 1920.

Recent Patents Relating to Rubber

The United States

Granted November 1, 1921

NO. 1,395,249 Parachute for aircraft. J. Bauer, Detroit, Mich.
1,395,302 Dispensing device. J. C. Shalkop, Philadelphia, Pa., assignor to DeLuxe Brush Co., Wilmington, Del.
1,395,342 Resilient heel. F. Graffes, Easthampton, Mass.
1,395,416 Hose supporter. W. S. Hunkins, Los Angeles, Calif.
1,395,417 Hose supporter. W. S. Hunkins, Los Angeles, Calif.
1,395,418 Golf ball marking device. A. G. Hupfel, Reno, Nev.
1,395,420 Spring tire. E. S. Johnson, Louis, Okla.
1,395,439 Inner tube. L. H. Lightfoot, Signal Mountain, assignor to Du Bois Rubber & Tube Co., Chattanooga—both in Tennessee.
1,395,535 Resilient heel. F. J. Walker, Wichita, Kans.
1,395,576 Tire tread. A. E. Jennings, Owensboro, assignor of ½ to S. J. Gish, Central City—both in Kentucky.
1,395,614 Pneumatic tire. R. Stock, Sandusky, O.
1,395,661 Wrapper for tires. E. H. Angier, Framingham, Mass.
1,395,686 Pneumatic tire. G. W. Lindley, Philadelphia, Pa.
1,395,723 Parachute for use with airplanes. F. C. Mears, Edinburgh, Scotland.
1,395,731 Valve pad for pneumatic tires. N. F. Rice, Chicago, Ill.
1,395,759 Gas mask. R. Monro, assignor to W. Kops—both of New York, N. Y.
1,395,760 Gas mask. R. Monro, assignor, to W. Kops—both of New York, N. Y.
1,395,761 Gas mask. R. Monro and E. Klauber, assignors to W. Kops—all of New York, N. Y.
1,395,763 Bath brush and sprayer. J. A. Mulherin, assignor of ½ to H. D. Delkeskamp—both of St. Louis, Mo.
1,395,770 Pneumatic tire. H. S. Rector, Chicago, Ill.
1,395,835 Gas mask. W. Kops, New York, N. Y.
1,395,836 Gas mask. W. Kops, New York, N. Y.
1,395,837 Gas mask. W. Kops, New York, N. Y.
1,395,863 Squeegee. J. F. Nelson, New York, N. Y.
1,395,878 Fountain pen. H. J. Upton, West Medford, assignor to Vaughn-Upton Co., Boston—both in Massachusetts.
1,395,936 Thread removing tool for use on tire valves. G. F. York, Salina, Kans.
1,395,948 Helmet and mask for use with respiratory apparatus. A. B. Dräger, Lübeck, Germany.

Granted November 8, 1921

1,396,134 Demountable rim for tires. W. S. Martin, Flint, Mich.
1,396,141 Pneumatic tire pressure gage. H. P. Neptune, San Diego, Calif.
1,396,170 Pneumatic tire. W. H. Emeno, Chelsea, assignor to Simplex Pneumatic Tire Co., Boston—both in Massachusetts.
1,396,313 Rubber boot, shoe, galosh, sandal, etc., W. C. Belknap, assignor to Robert E. Miller, Inc.—both of New York, N. Y.
1,396,423 Man's garter. M. B. Hammond and H. H. Taylor, assignors to The Thos. P. Taylor Co.—all of Bridgeport, Conn.
1,396,429 Mask for the inhalation of carbon dioxid. Y. Henderson, New Haven, Conn.
1,396,515 Pneumatic tire. W. S. McClevey, St. Louis, Mo.
1,396,641 Medicated chewing gum. G. King, Atlanta, and C. G. Adsit, Tallulah Falls—both in Georgia.
1,396,646 Inner tube deflator. G. S. Mellor, Philadelphia, Pa.
1,396,648 Automobile tire filler. S. D. Mills and H. Paul—both of Oklahoma, Okla.
1,396,709 Method of obtaining samples from a balloon while inflated. R. H. Upson, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

Granted November 15, 1921

1,396,742 Pneumatic tire. C. F. A. Gray, Montreal, Can.
1,396,778 Vehicle tire fastener. W. H. Parham, assignor to Parham Auto Patents Corporation—both of Knoxville, Tenn.
1,396,984 Resilient wheel. G. M. Willis, Chicago, Ill.
1,397,027 Tire valve cap. H. A. Wood, Kingston, Ontario, Can.
1,397,235 Dust cap for tire valves. S. R. Sabel, Chicago, Ill.
1,397,248 Life preserver. A. D. Frantz, Battle Creek, Mich.
1,397,250 Goggles. E. T. P. Goodyear, Reigate Heath, England.
1,397,359 Resilient tire. E. B. Brookshire, Eldorado, Kans.
1,397,466 Rubber umbrella. L. A. Sygler, Newark, N. J.

Granted November 22, 1921

1,397,511 Windshield cleaner. C. F. Green, assignor to The Willys-Overland Co.—both of Toledo, O.
1,397,565 Demountable rim for tires. J. H. Wagenhorst, Jackson, Mich.
1,397,574 Pneumatic cushion for typewriter keys. J. J. Coomber, Hoboken, N. J., assignor to Munson Supply Co., New York, N. Y.
1,397,579 Garment protector. G. K. Guinzburg, assignor to I. B. Kleinert Rubber Co.—both of New York, N. Y.
1,397,619 Low pressure signal for automobile tires. L. Y. Chard, Newcastle, Ind.
1,397,785 Umbrella with inflatable ribs, etc. C. G. Stonestreet, Akron, O.
1,397,795 Rubber tire. W. T. Clifford-Earp, Barnes, England.
1,397,823 Demountable rim for tires. E. Rogowski, assignor of ½ to B. Freud—both of Chicago, Ill.
1,397,834 Detachable rubber heel for shoes. S. Dow, Boston, Mass.
1,397,835 Stylus holder for phonograph reproducers. M. Elmer, Hastings, Mich.
1,397,840 Teat cup. A. C. Macartney, Syracuse, N. Y.
1,397,943 Hose clamp. F. J. Costello, assignor to Federal Tin Co., Inc.—both of Baltimore, Md.
1,398,169 Pneumatic tire. R. R. à Court Beadon, Agra, India.
1,398,200 Tire with plurality of permanently inflated independently removable spherical air cells. H. Owen, Roosevelt, Utah.
1,398,208 Portable shower bath apparatus. L. A. Trial, Los Angeles, Calif. (Renewed October 24, 1921.)

Granted November 29, 1921

1,398,259 Tire cover. H. S. Dube, New York, N. Y.
1,398,303 Parachute and process of folding. L. C. Mitchell, Chicago, Ill.
1,398,316 Dust cap and sleeve for inflating valve tubes. E. O. Collins, Chillicothe, O.
1,398,368 Milking machine teat cups. C. Enderf, Jr., assignor to The Burton Page Co.—both of Chicago, Ill.
1,398,414 Halfsole for pneumatic tires. F. F. Brucker, assignor to The Miller Rubber Co.—both of Akron, O.
1,398,482 Pneumatic tire. H. H. Allyn, assignor to Standard Rubber Co.—both of Houston, Tex.
1,398,513 Pneumatic tire tread. J. A. Healy, Brooklyn, N. Y.
1,398,566 Tire mounting. L. J. Perkins, Lewiston, Idaho.
1,398,574 Tire. S. Rice, Omaha, Nebr.
1,398,603 Vehicle tire fastener. W. H. Parham, assignor to Parham Auto Patents Corporation—both of Knoxville, Tenn.
1,398,604 Tire rim nut. M. C. Schweinert, West Hoboken, N. J.
1,398,624 Union undergarment with elastic insert across back at belt line. A. E. Clarke, Grand Rapids, Mich.
1,398,627 Resilient cushion for heels. J. M. Combs, Akron, assignor of ½ to V. R. Smithfield, Cleveland—both in Ohio.
1,398,631 Rubber heel. S. De Grazia, Washington, D. C.
1,398,657 Elastic corset. E. Thompson, Chicago, Ill.
1,398,700 Non-collapsible pneumatic tire. J. B. Lynch, Syracuse, N. Y.
1,398,701 Elastic step mat. W. MacPherson, Cambridge, Mass.
1,398,800 Fountain pen. F. Regero, Macon, Ga.
1,398,862 Cushion tire. A. John, Boston, Mass.
1,398,880 Resilient wheel. R. W. Miller, Wilmington, Del.
1,398,893 Ground gripper detachable tire tread, E. Erik, assignor, by direct and mesne assignments of 2/10 to E. I. Quick—both of Ossining, and 3/10 to A. W. Harvey, New York—both in New York.
1,398,933 Pneumatic shock absorber for automobiles, comprising a plurality of inflatable cushions maintained between the axles and the chassis. J. W. Brereton, deceased, by R. K. Brereton, executor, Athlone, Ireland.
1,398,940 Inner tube and method of manufacture. J. M. Combs, Akron, assignor of ½ to V. R. Smithfield, Cleveland—both in Ohio.

The Dominion of Canada

Patented November 1, 1921

214,018 Automobile tire pump. W. H. Calder, Stirling, Ont.
214,041 Water shoe with pneumatic pouches. A. P. Horn, Cincinnati, O.

Patented November 8, 1921

214,105 Combination fountain pen and pencil. M. M. Bet, Moose Jaw, Sask.
214,139 Garter with pocket. L. G. Warren, Westwood, Calif.
214,198 Jar closure with soft rubber stopper. H. Geering, Basel, assignee of H. Schwieger—both of Hanover, Germany.

The United Kingdom

Published November 2, 1921

168,826 Tire interliner. R. Blakoe, 46 Bryanston street, Marble Arch, London.
168,875 Pneumatic tire with row of solid or hollow balls between inner tube and casing. W. H. Emeno, 32 Tudor street, Chelsea, Mass., U. S. A. (Not yet accepted.)
168,885 Respiratory apparatus. R. von der Heide, 43 Wielandstrasse, Charlottenburg, Berlin, Germany. (Not yet accepted.)
168,924 In parachute apparatus for controlling the descent of mail bags, parcels and the like, dropped from aircraft, the mail bags may be fitted with a pneumatic cushion and the bottom of the parachute casing be provided with a guard of rubber-covered bent rods. H. E. S. Holt, The Grange, Farnborough, Hampshire.
169,004 School slate with frame of rubber or similar material. H. C. Chocksee, 553 Girgaum Road, Bombay, India.
169,030 Reservoir pen. T. Kovács, 108 Lindenstrasse, Berlin, Germany.
169,040 Fountain shaving brush. T. McMonagle, Howland, Me., U. S. A.
169,052 Pneumatic massage appliance. H. D. Byers, 5 Leinster Square, Westbourne Grove, London.
169,087 Sponge rubber absorbent dressings, catamenial appliances, etc. E. Hunt, 12 Earnshaw Bridge, Leyland, near Preston.
169,115 Reservoir pens. M. D. Davis, 6 Cardinal Mansions, Carlisle Place, London.
169,119 Ash tray with central projection cushioned with rubber or soft material, for knocking pipes on. J. E. L. Whitehead, 50 Owlstone Road, Cambridge.
169,127 Tire repair vulcanizer. E. R. Harris, 17 rue St. Foy, Veuilly-sur-Seine, France.
169,174 Cushion heel. F. Borman, 3810 Fillmore street, Chicago, Ill., U. S. A. (Not yet accepted.)

Chemical Patents will be found on page 276. Machinery Patents on page 279.

Published November 9, 1921

169,269 Tire attachments to rims. R. L. Rapson, Ottershaw Park, Chertsey, Surrey.
169,303 Tire cover reenforced by embedded strip of woven wire. H Midgley, 12 Burnley Road, Luddenden Foot, Yorkshire.
169,320 Tire or tire core. E. Carpentier, 46 rue Bas-Rhieux, Liège, Belgium.
169,376 Cushioned spring wheel. E. Martin, 67 Silverthorne Road, Battersea, London.
169,379 Beaded edge of pneumatic tire cover formed of wires, cords, or cables around which the fabric foundation is wrapped. E. C. R. Marks, 57 Lincoln's Inn Fields, London; The Fisk Rubber Co., Chicopee Falls, Mass., U. S. A.
169,385 Spring tire. E. Bylund, 579 Jarvis avenue, Winnipeg, Can.
169,423 Reservoir drawing pens. H. Rusterholz, Habsburgstrasse, Zürich, Switzerland. (Not yet accepted.)
169,433 Tire filler. E. F. Branen, 714 Douglas avenue, Elgin, Ill., U. S. A. (Not yet accepted.)
169,445 Reservoir pens. A. Winter, Jersey City, New Jersey, U. S. A. (Not yet accepted.)
169,447 Rubber tire with vulcanite base and softer body and tread portions. P. Fayol, 7 rue Escudier, Boulogne, France. (Not yet accepted.)

Published November 16, 1921

169,544 Aviator's helmet employing sponge rubber face mask. H. Round, 141 Great Charles street, and A. H. Parrott, 87 Cornwall street—both in Birmingham, and R. H. Davis, 187 Westminster Bridge Road, Westminster.
169,568 Hose coupling. H. J. Fitzpatrick, 153 Nellie B avenue, Athens, Ga., U. S. A.
169,616 Reservoir pen. J. M. Cavaille, rue Garros, Cannes, France.
169,624 Spring wheels with pneumatic hub. G. Casalis, 107 Corso Francia, Turin, Italy.

Published November 23, 1921

169,809 Resilient tire. V. Le Buchman, 319 Berwyn avenue, Trenton, New Jersey, U. S. A.
169,846 Warning horn coated with vulcanized rubber, vulcanite, ebonite, celluloid, etc. J. F. Smith, 31 Speedwell Road, Edgbaston, Birmingham.
169,866 Attachment for tire valves. E. H. and H. Hill, 56 Broomhall street, Sheffield.
169,879 Stitcher wheels of tire carcass-making machine. The Goodyear Tire & Rubber Co., and F. A. Seiberling, 1144 Market street, Akron, Ohio, U. S. A.

Published November 30, 1921

170,105 Machine for removing dandruff, etc., from and for massaging the scalp, having rubber teeth on nozzle end. F. C. Dexter, 42 Harpenden Road, West Norwood, London.
170,141 Reservoir pen. F. Evans, 61 Church Hill Road, Handsworth, Birmingham.
170,259 Dust cap for tire valves. A. Schrader's Son, Inc., 783 Atlantic avenue, Brooklyn; assignee of M. C. Schweinert, 42 Riverside Drive, New York—both in New York, U. S. A. (Not yet accepted.)

New Zealand

Published October 20, 1921

43,951 Pneumatic shock absorber. H. Seibel, 572 Folsom street, San Francisco, Calif., U. S. A. (See THE INDIA RUBBER WORLD, January 1, 1921, page 345.)
44,580 Improved teat-cups for milking machines. W. F. Turk and S. Nielsen, both of Bowen street, Brisbane, Queensland.

Germany

Patents Issued with Dates of Issue

344,967 (October 29, 1920) Link chain for double solid tires. Walter Lion, Antonstrasse unter den Hochgleisen, Dresden.
344,968 (January 27, 1921) Protective insert for treads. Pieper & Engelbert G. m. b. H., Neuemühle, Kr. Altena, Westphalia.
345,097 (October 3, 1920) Packing ring. Philipp Husmann, Gronau, Hanover.
345,745 (June 27, 1920) Hollow shoe heel with rubber patch. Vito Benedetto Greco and William Franklin Baum, Waterloo, United States; represented by : G. Caminer, Berlin W. 62, and K. Wentzel, Frankfort-on-the-Main.
345,930 (March 2, 1920) Tread. Richard Schröter, Meyerstrasse 180, Bremen.
346,012 (September 25, 1919) Adhesive plaster with comb-shaped closing edges. "Vulnoplast" Fabrik Bonner Kautschukpflaster und Chem.pharm. Praparate Elise Lakemeier, Bonn.
346,491 (May 8, 1920) Elastic tire. Lucas M. Campi, New York: represented by Dr. E. Müller, Berlin S. W. 68.
346,527 (June 8, 1921) Suspensory without side pieces. Firma Heinrich Caroli, Lahr, Baden.

TRADE MARKS

The United States

Two Kinds of Trade Marks Now Being Registered

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section 1 (b), are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the latter act, trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

Granted November 1, 1921, Act of February 20, 1905

147,751 EVERSTRETCH ELASTIC—elastics. Wm. B. Bliss, Jr., & Co., New York, N. Y.
147,757 CROWN—tire pumps. Bridgeport Brass Co., Bridgeport, Conn.
147,763 CONKLIN CRESCENT—fountain pens. The Conklin Pen Manufacturing Co., Toledo, O.
147,770 FEDERAL—rubber mats and matting. The Federal Rubber Co., Cudahy, Wis.
147,771 FEDERAL—automobile bumpers and pedal rubbers. The Federal Rubber Co., Cudahy, Wis.
147,774 SANIWHITE—conveyor belts of fabric combined with rubber. The B. F. Goodrich Co., New York, N. Y.
147,781 IVY—garters and hose supporters. Ivy Corset Co., Worcester, Mass.
147,798 "M. B."—liquid rubber cements. Montgomery Bros., Inc., Philadelphia, Pa.
147,802 OKOLOOM—insulated conductors and cables for electrical purposes. The Okonite Co., Passaic, N. J.
147,830 WESTEX—imitation leather and waterproof cloth. Western Cartridge Co., East Alton and Springfield, Ill.

Granted November 8, 1921, Act of February 20, 1905

147,995 AUBURN, W. K. M.—tires, tubes, and accessories. The Double Fabric Tire Co., Auburn, Ind.
148,017 FAULTLESS—rubber balloons, dolls, animals, and balls. The Faultless Rubber Co., Ashland, O.
148,046 CLIMAX—dress shields and diaper supporters. M. S. George, St. Louis, Mo.
148,056 OH BOY—chewing gum The Goudey Gum Co., Boston, Mass.
148,086 INDIA—rubber cement, rubber gum, and gum for repairing tire-tread cuts. The India Tire & Rubber Co., Mogadore, O.
148,092 IROKESE—toys of rubber, composition, etc. Irokese Trading Corporation, New York, N. Y.
148,115 KM—windshield cleaners. The K-M Manufacturing Co., Toledo, O.
148,154 GRENADIER—rubber and canvas belts and rubber hose. The Manhattan Rubber Manufacturing Co., Passaic, N. J.
148,182 NEW JERSEY ZINC—paint pigments, particularly zinc oxid, leaded zinc oxid, ocher, and lithopone. The New Jersey Zinc Co., New York, N. Y.
148,184 NEW JERSEY ZINC—chemicals and lithopone used in rubber compounding. The New Jersey Zinc Co., New York, N. Y.
148,227 DEVIL-GRIP—sheet rubber patches for tires and tubes. The Red Devil Patch Co., Hopkinsville, Ky.
148,247 GOLD COIN—suspenders. The Russell Manufacturing Co., Middletown, Conn.
148,262 MONTBLANC—fountain pens. Simplo Fullfeder-Gesellschaft Voss, Lausen & Dziambor, Hamburg, Germany.
148,264 JEM RUBBER REPAIR and representation of a diamond inside a tire—plastic rubber material for repairing rubber goods. James E. Smith, Philadelphia, Pa. (See THE INDIA RUBBER WORLD, January 1, 1921, page 259.)

Act of March 19, 1920, Section 1 (b)

148,338 PATTEN QUALITY—rubber patches, tires, and tubes. Patten Manufacturing Co., Chattanooga, Tenn.
148,340 TWIN and representation of collapsible tire rim—collapsible tire rims. Henry Schaechterle, Friend, Neb.

Granted November 15, 1921, Act of February 20, 1905

148,344 ATS NATIONAL SERVICE, YOUR FAVORITE TIRE IN STANDARD MAKE SECONDS on silhouette map of United States—tires and tubes. Amalgamated Tire Stores Corporation, New York, N. Y.
148,355 Representation of a turkey—rubber sponges. G. W. Beldam, Ealing, England.
148,389 DICK'S PACKING—all kinds of asbestos packing and hose. Dick's Asbestos Co., London, England.
148,403 KUTE KIDS—chewing gum. H. C. Faust, St. Louis, Mo.
148,405 FEDERAL RUGGED RED SHEET on representation of a washer—rubber or composition packing. The Federal Rubber Co., Cudahy, Wis.
148,416 "SUNOLITH"—lithopone. The Glidden Co., Cleveland, O.
148,417 SOLVO—tires S. H. Goldberg, Chicago, Ill.
148,419 XX below a small black diamond—hose made of rubber, reinforced with fabric and a helix of metal. The B. F. Goodrich Co., New York, N. Y.
148,429 HAYWOOD'S TIRE SURGERY—tire-repair equipment. Haywood Tire & Equipment Co., Marion, Ind.
148,445 ORIENT—tires and tubes. The India Tire & Rubber Co., Akron and Mogadore, O.
148,452 AD-MOR-MYLER—tires. E. A. Jaquins, Los Angeles, Calif. (See THE INDIA RUBBER WORLD, June 1, 1920, page 607.)
148,456 K & B as a monogram—oils and waxes used in rubber compounding. Katzenbach & Bullock Co., New York, N. Y.
148,471 M with wings extending from each side, superimposed on representation of a tire—tires, tubes, tire casings and patches. The McLean Tire & Rubber Co., Cleveland, O.
148,472 2 IN 1—vulcanizing patches. Magic Auto Devices Co., Inc., Lynbrook, N. Y.
148,501 PAXTITE—composition sheet packing. Pacific Coast Rubber & Supply Co., San Francisco, Calif.
148,520 EFFICIENCY on a shield having monogram RB at top—hot-water bottles, ice bags, cushions, syringes, etc. Reid Bros., Seattle, Wash., and San Francisco, Calif.
148,526 CLOUDBURST on conventional representation of a cloud dropping rain—raincoats. Harry Rosenberg, New York, N. Y.
148,530 RITOGRAPH—stylographic pens. Salz Brothers, New York, N. Y.
148,551 UNITED AUTO STORES, INC., combined with representation of automobile and three links of a chain—red, black, and gray inner tubes.
148,557 WESTERN WESTEX within oval—imitation leather and waterproof cloth. Western Cartridge Co., East Alton and Springfield, Ill.

Act of March 19, 1920, Section 1 (b)

148,566 NEVER-LOSE—stylists' erasers. Argus Manufacturing Co., Chicago, Ill. (See THE INDIA RUBBER WORLD, July 1, 1918, page 606.)
148,577 SOLID SET—shaving brushes. The James Lowe Erskine Co., New York, N. Y.
148,578 FOLBERTH—squeegee type windshield cleaners. The Folberth Auto Specialty Co., Cleveland, O.

Granted November 22, Act of February 20, 1905

148,710 REFLEX—fountain pens. Simplo Fullfeder-Gesellschaft Voss, Lausen & Dziambor, Hamburg, Germany.
148,712 Conventionalized outline of combined circle and rectangle with corners cut off—shoes of leather, canvas and leather, canvas and rubber, and leather and rubber. J. P. Smith Shoe Co., Chicago, Ill.
148,743 PRESTO—baby pants and aprons. Jacob Stein, New York, N. Y.
148,751 Conventionalized scroll—chewing gum. Wm. Wrigley Jr. Co., Chicago, Ill.
148,752 CHESTER—suspenders, garters, men's belts and armbands. A. Ziegler & Sons Co., Roxbury, Mass.

Granted November 29, Act of February 20, 1905

148,778 RUB-R-BAK above representation of black cat in silhouette—portable repair kits. The American Automobile Accessories Co., Cincinnati, O.
148,783 Representation of a bulldog—dental rubber, dam, bulbs, etc. Atlantic Rubber Manufacturing Corporation, New York, N. Y.
148,785 Representation of an automobilist standing behind and pointing to a scroll whose ends pass through two tires—Automobile Owners' Tire Corporation, St. Paul, Minn.
148,807 CORONADA—tires and tubes. Corona Cord Tire Co., East Butler, Pa.
148,810 TOUGH AS A RHINO, accompanying representation of two rhinoceroses, each with a tire around its body, having a tug-of-war, stretching an inner tube with their front tusks—tires and tubes. Cupples Company Manufacturers, St. Louis, Mo.
148,830 HIKER—rubber and composition soles and heels. Essex Rubber Co., Trenton, N. J.
148,850 OKEH—rubber cement. Hadley Bros.-Uhl Co., St. Louis, Mo.
148,869 HONESTY—men's, women's, and children's shoes of leather, rubber, fabric, and combination materials. International Shoe Co., St. Louis, Mo.
148,870 Profile of an Indian within two concentric circles cut by the feather on his head—rubber balls and other toys. Irokese Trading Corporation, New York, N. Y.
148,936 EAGLE—golf balls. A. J. Reach Co., Philadelphia, Pa.
148,943 HIGHLAND HEATHER—raincoats. Rosenwald & Weil, Inc., Chicago, Ill.
148,964 P-K°—sugar-coated chewing gum. Wm. Wrigley Jr. Co., Chicago, Ill.

The Dominion of Canada

Registered

29,618 C. & Co. between horns of a crescent horizontally arranged—antimony, lead, litharge, and other chemicals used in the rubber and other industries. Cookson & Co., Limited, Milburn house, Dean street, Newcastle-on-Tyne, Northumberland, England.
29,684 Representation of an arrow-head bearing the word DURAL, the letters UBBER being shown under the R in the word DURAL—tire casings, covers, and inner tubes, hose connections and asbestos brake linings. Dural Rubber Corporation, Flemington, New Jersey, U. S. A.
29,713 KIDDY KUMFY—children's toilet articles, infants' rubber pants, crib sheets, bibs, etc., made of rubber, rubberized material, or waterproof cloths. Kelton Rubber Co., Toronto, Ont.
29,714 BONNIE BABY—children's toilet articles, infants' rubber pants, crib sheets, bibs, etc., made of rubber, rubberized material, or waterproof cloths. Kelton Rubber Co., Toronto, Ont.
29,725 DU PONT within an oval—lithopone, dry colors, and pigments used in rubber compounding. E. I. du Pont de Nemours & Co., Wilmington, Del., U. S. A.
29,731 PARTRIDGE and the particular arrangement of alined P's, the lines of P's being parallel and in intimate contact laterally and the P's of each line being alternately inverted and right, while the P's of one line are in staggered relation with the P's of the parallel line—cord and fabric tires.

The United Kingdom

Published November 2, 1921

B409,358 INGRAM'S LONDON—hot-water bottles and beds, photographic and spray balls, tubing, bulbs, bellows, syringes, insulation gloves, stoppers, etc. J. G. Ingram & Son, Limited, The London India-Rubber Works, Felstead street, Hackney Wick, London, E. 9.
414,969 HEMUS—brake and clutch linings, asbestos packing, tire-puncture closing compositions, tire-repair outfits, etc. Haslam & Stretton, Limited, 11 Windsor Place, Cardiff.
416,852 ATLAS—rubber and gutta percha goods not included in classes other than No. 40, except machine belting. The New Atlas Rubber Co., Limited, 55 Faulkner street, Manchester.
418,258 DURARUB—floor coverings included in Class No. 36. Broadhurst & Co., Limited, 4 Gibbon street, Bradford, Manchester.
418,259 BROLINO—floor coverings included in Class No. 36. Broadhurst & Co., Limited, 4 Gibbon street, Bradford, Manchester.

Published November 9, 1921

413,747 PARALITE—vulcanite goods not included in classes other than No. 40. The Tough Rubber Co., Limited, 447 Wincolmlee, Kingston-upon-Hull, Yorkshire.
415,064 PAL—propel pencils and erasers. The Hoge Manufacturing Co., Inc., 215 Fulton street, New York, U. S. A.; address for service in the United Kingdom, care of Marks & Clerk, 57 Lincoln's Inn Fields, London, W. C. 2.
415,839 DON FRICTION FABRICS—brake and clutch linings, wholly or partly of asbestos or textile material. Hays, Standen & Co., Limited, 71 Southwark street, London, S. E. 1.

Published November 16, 1921

408,584 ADAMS KIS-ME—chewing gum. Adams & Beemans, Limited, 89 Great Eastern street, London, E. C. 2.
413,958 "MAGIC" above oval containing representation of a magician—tire and tube repair material containing rubber. Marcel Hennequin, 60 Boulevard de Clichy, Paris, France; address for service in the United Kingdom, care of McKenna & Co., 31 Basinghall street, London, E. C. 2.
B416,330 REPLICA—drawing rubbers and erasers, etc. Entwistle Thorpe & Co., 42 Deansgate, Manchester; Entwistle Thorpe & Co., Limited, 35 Great Peter street, Westminster, London, S. W. 1.
416,676 Representation of a label picturing an elephant and bearing in English, Chinese, and Malayan letters and characters the name or its equivalent, GUTHRIE & CO., LIMITED, SINGAPORE—rubber and gutta percha goods not included in classes other than Class No. 40, excepting webs, tires, insulated wire, or heels and soles. Guthrie & Co., Limited, 11 Colyer Quay.
418,241 Representation of two animals resembling wolves—all goods included in Class No. 40. Nissim Jose de Mayo, trading as N. de Mayo, 62 London Wall, London, E. C. 2.
419,029 AQUATHRUSTER—rainproof and waterproof garments. I. Marks & Co., 115 Liverpool Road, Manchester.

Published November 23, 1921

415,248 DANIEL composed of a large D with an oblique cross-bar bearing the letters ANIEL, superimposed above representation of a roll of packing—packing included in Class No. 50. Quaker City Rubber Co., 629 Market street, Philadelphia, Pa., U. S. A.; address for service in United Kingdom, care of Fell & James, 11 Queen Victoria street, London, E. C. 4.
416,853 Representation of the eastern hemisphere and the words THE NEW ATLAS RUBBER CO., LIMITED—rubber and gutta percha goods not included in classes other than No. 40, excepting sheets, machine belting, tobacco pouches, tires, or repair bands and patches for tires. The New Atlas Rubber Co., Limited, 55 Faulkner street, Manchester.
418,460 REDDAWAY BELTING accompanying representation of eastern and western hemispheres and two camels within conventionalized horizontal oval having just inside the ends small circles containing outline map of British Isles and Australia—machine belting included in Class No. 50. F. Reddaway & Co., Limited, Victoria Mills, Cheltenham street, Pendleton, Manchester, Lancashire.
418,634 DIANA—rubber soles, heels, pads, and protectors for boots and shoes, and elastic webbing. William Mason (Leicester), Limited, Advance Works, Hollow Road, Anstey, Leicester.
418,871 BASILIC—waterproof aprons. Basil Cockrell, 24 Charing Cross Road, London, W. C. 2.
418,913 RAYSISTA—sheets and gloves specially prepared for use in connection with X-ray apparatus. J. G. Ingram & Son, Limited, London India-Rubber Works, Felstead street, Hackney Wick, London, E. 9.
419,058 BATIK—rubber and gutta percha goods not included in classes other than Class No. 40. C. E. Needham & Bro., Limited, 16 Change Alley, Sheffield.
419,263 PERFMAC—macintoshes and other rainproof wearing apparel. W. H. H. Pearce, 83 Regent street, London, W. 1.

Published November 30, 1921

414,446 Profile of an Indian in silhouette within a circular band bearing the words in white letters SENECA STANDARD—tripoli flour. American Tripoli Co., Seneca, Mo., U. S. A.; address for service in the United Kingdom, care of A. M. & Wm. Clark, 53 Chancery Lane, London, W. C. 2.
B417,399 MAX—tires. C. L. Cuthbe, trading as Chas. L. Cuthbe & Co., 37 Great Eastern street, London, E. C. 2.
B419,712 ARCO—golf balls. Arthur & Co., Limited, 78 Queen street, Glasgow.

DESIGNS

The United States

Patented November 1, 1921

59,542 Rubber ball or similar article. Term 14 years. F. W. Dodge, assignor to the Seamless Rubber Co.—both of New Haven, Conn.
59,547 Sponge rubber doll. Term 7 years. C. F. Flemming, assignor to The Miller Rubber Co.—both of Akron, O.
59,548 Sponge rubber doll. Term 7 years. C. F. Flemming, assignor to The Miller Rubber Co.—both of Akron, O.
59,549 Sponge rubber doll. Term 7 years. C. F. Flemming, assignor to The Miller Rubber Co.—both of Akron, O.
59,550 Sponge rubber doll. Term 7 years. C. F. Flemming, assignor to The Miller Rubber Co.—both of Akron, O.
59,551 Sponge rubber doll. Term 7 years. C. F. Flemming, assignor to The Miller Rubber Co.—both of Akron, O.
59,566 Man's garter. Term 14 years. J. Press, New York, N. Y.

59,653 59,619 59,655 59,673 59,674 59,811 59,794 59,717 59,684 59,755 59,803 59,689 59,815 59,699 59,806

Patented November 15, 1921

59,619 Non-skid tire. Term 14 years. W. A. Brubaker, Akron, O., assignor to H. McCreary, Indiana, Pa.
59,646 Suction bulb. Term 7 years. A. E. Fraass, New Rochelle, N. Y.
59,653 Tire. Term 14 years. C. G. Hoover, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.
59,655 Tire. Term 14 years. J. Hotchkiss, Sebring, O.
59,673 Tire casing. Term 3½ years. G. W. Odell, assignor to International India Rubber Corporation—both of South Bend, Ind.
59,674 Tire tread. Term 3½ years. G. W. Odell, assignor to International India Rubber Corporation—both of South Bend, Ind.
59,684 Cushion tire. Term 14 years. A. A. Robb, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.
59,689 Tire tread. Term 7 years. E. H. Simms, Scottdale, Pa.

Patented November 22, 1921

59,699 Tire. Term 14 years. D. L. Becker, Oakland, Calif.
59,714 Rubber heel. Term 14 years. W. H. Clarke, Toronto, Ont., Can.
59,717 Solid truck tire. Term 14 years. H. B. Coats, Veedersburg, Ind.
59,718 Toy balloon doll. Term 14 years. W. M. Colvin, assignor of 1/5 to R. B. Owen—both of Washington, D. C.
59,736 Garment protector. Term 14 years. M. S. George, St. Louis, Mo.
59,753 Rubber heel. Term 14 years. R. Iredell, assignor to The General Tire & Rubber Co.—both of Akron, O.
59,755 Tire. Term 14 years. K. B. Kilborn and W. S. Wolfe, assignors to The Goodyear Tire & Rubber Co.—all of Akron, O.
59,794 Tire. Term 7 years. W. F. Troast, Lancaster, Pa.
59,803 Tire. Term 14 years. W. W. Wolfe, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

Patented November 29, 1921

59,806 Tire. Term 3½ years. A. K. and C. A. Allen, Seattle, Wash.
59,811 Tire. Term 14 years. W. P. Graender, Montclair, N. J.
59,815 Tire. Term 14 years. J. Christy, Cleveland, O.
59,864 Toy balloon. Term 14 years. F. B. Pastir, Barberton, O.
59,865 Toy balloon. Term 14 years. F. B. Pastir, Barberton, O.

The Dominion of Canada

Patented October 25, 1921

5,204 Tire tread. The Bawden Machine Co., Limited, Toronto, Ont.
5,205 Tire tread. The Bawden Machine Co., Limited, Toronto, Ont.
5,206 Tire tread. The Bawden Machine Co., Limited, Toronto, Ont.
5,207 Tire tread. The Bawden Machine Co., Limited, Toronto, Ont.

Patented October 29, 1921

5,208 Non-skid tire tread. Ames Holden McCready, Limited, Montreal, Que.
5,209 Tire tread. The Bawden Machine Co., Limited, Toronto, Ont.
5,210 Tire tread. The Bawden Machine Co., Limited, Toronto, Ont.

Germany

Design Patents Issued with Dates of Issue

795,307 (February 28, 1921). Rubber sleeve holder. Fritz Barth, Märkische Strasse 125a., Barmen-Rittershausen.
795,855 (September 30, 1921) Adjustable crutch of rubber with metal core. Carl Prandtl Schwanthaler Strasse 80, Munich.
796,024 (October 3, 1921) Armored driving belt. Karl Brettschneider, Mihr-Schönberg; represented by: Hans Caminer, Berlin W 62.
796,097 (October 1, 1921) Padding for crutches and the like, of sponge rubber. Felten & Guilleaume Carlswerk Akt.-Ges., Köln-Mülheim.
796,115 (December 16, 1919) Sanitary napkin holder. Fany Walla, née Eppl, Büchsenstrasse 8, Stuttgart.
796,173 (October 3, 1921) Rubber sole with protective rubber rings. Rheinische Gummi-Gesellschaft W. Klotz & Co., Düsseldorf.
796,180 (October 5, 1921) Artificial flower of rubber. Radium-Gummiwerke, Dellbrück, near Köln.
796,181 (October 5, 1921) Artificial flower of rubber in the form of a dahlia. Radium-Gummiwerke, Dellbrück, near Köln.
796,189 (October 7, 1921) Rubber heel without nails or gum. Ludwig Sturenhäumer, Bergerstrasse 21, Düsseldorf.
796,537 (August 11 1921) Dog collar. Franz Clouth Rheinische Gummiwarenfabrik Akt.-Ges., Köln-Nippes.
796,739 (April 25 1921) Elastic tire. William Schirmer, Rieder, Harz.
796,786 (October 10, 1921) Rubber suction bicycle handle. Rudolf Theel, Helmholtzstrasse 13, Charlottenburg.
796,914 (October 8, 1921) Rubber packing ring without insert and with elliptic cross section. Franz Clouth, Rheinische Gummiwarenfabrik Akt.-Ges., Köln-Nippes.
796,916 (October 8, 1921) Hard rubber blower joining piece for balloon powder sprayers. Dr. W. Klein, Offenburg.
796,921 (October 11 1921) Syringe for medical and technical purposes. Anton Haas, Seilerstrasse 13, Frankfurt a. M.
796,968 (October 5, 1921) Adjustable rubber cord fastening for wheel fellows. Alexander Giegold, Crimmitschau, Saxony.
797,002 (December 2, 1920) Exchangeable heel of rubber, leather or other material. Wilhelm Schouten. Ernst-August-Strasse 10, Hanover.
797,128 (October 14, 1921) Sanitary napkin. Heinz Dietrich, Schulstrasse 1, Darmstadt.
797,287 (October 13 1921) Syringe for hygienic purposes. Wilhelm Rudolf Thost Könneritz-strasse 10, Leipzig-Schleussig.
797,408 (October 11, 1921) Cannula for air pipe. Carl Reiner & Lieberknecht G. m. b. H., Vienna; represented by W. Schwaebsch, Stuttgart.
797,423 (October 15, 1921) Cannula for washing apparatus. Karl Bayer, Herrenkellergasse 1, Ulm-on-the-Danube.
797,526 (October 10, 1921) Stuffing box packing. Hans Hänsele, Seerobenstrasse 30, Wiesbaden.
797,656 (December 28, 1920) Pessary. Albert Maybaum, Rathenowerstrasse 6, Berlin.
797,732 (September 14, 1921) Heel tread of rubber and leather. Württ. Gummi- und Lederstanzwerk Christian Eifer, Haubershrenn.
797,782 (September 10, 1921) Rupture band. Adolf Thomé, Wilhelmstrasse 26, Saarbrücken.
797,962 (October 14, 1921) Suspender of solid rubber. Ferdinand Bauwens, Mainzer Landstrasse 50, Frankfort-on-the-Main.
797,963 (October 14, 1921) Suspender of solid rubber. Ferdinand Bauwens, Mainzer Landstrasse 50, Frankfort-on-the-Main.
797,984 (October 22, 1921) Elastic flannel binder. Pfälzische Bandagenfabrik Karl Otto Braun, Wolfstein, Rheinpfalz.
798,031 (October 19, 1921) Rubber layer holder for heels. Hugo Bannas and Bruno Günther.

URUGUAY'S IMPORTATIONS OF RUBBER GOODS

Uruguay, of importance among South American countries through its large purchasing power and its per capita foreign trade, has imported most of its rubber goods from the United States during the last few years. In the tire trade, while American exporters have had to compete with the French and Italian, and to some extent, the English and Canadian markets, our total exports of automobile casings, tubes, and solids to Uruguay for the year ended June, 1917, was $100,427; and for the calendar year 1919, $645,970. For 1920 our shipments continued to increase and were as follows: Casings, $808,621; inner tubes, $85,294; solids, $9,802; and all other tires, $3,721. The falling off of these exports in the current year, however, is due to unfavorable exchange, competition, and overstocking in 1920.

Conditions in the rubber shoe industry are most encouraging. In 1913 there were 42,935 pairs of rubber shoes exported from the United States, and 57,330 pairs in 1920. For the first nine months of 1921, 50,200 pairs have been shipped. A consular report for November, 1920, stated that 90 per cent of the rubber boots and shoes imported into Uruguay came from the United States, the remainder from England. Prospects are also favorable for the trade in druggists' sundries, while Japan and Italy are the only competitors in the market for rubber toys, gloves, and rubber clothing.

ARGENTINA AS A MARKET FOR RUBBER GOODS

With greater purchasing power than any other of the South American countries, Argentina offers an attractive field to the rubber industry. Buenos Aires, the principal port and distributing center, is a well-known market for the exporter. While manufacturing of all kinds is carried on in Argentina to supply local needs, importations also figure largely, America holding a position of importance. In the tire and tube market, for instance, the United States shares the lead with France, while before the war it was held by Germany, with England a close second, and the United States, Italy and France following in the order named. "In 1919 the total value of automobile casings, tubes, and solids exported from the United States to Argentina was $1,788,147. In 1920 the values for each item were: casings, $2,792,808; inner tubes, $307,143; solid tires, $20,886."

An increase is noted also in the trade in rubber hose, belting, rubber shoes, soles and heels, and in druggists' sundries. The outlook for the rubber shoe trade is especially promising. Statistics are interesting as illustrating this branch of the rubber industry:

UNITED STATES EXPORTS OF RUBBER BOOTS AND SHOES TO ARGENTINA

	Boots		Shoes	
Year[a]	Pairs	Value	Pairs	Value
1913	122	$477	25,210	$15,045
1914	140	389	6,659	2,939
1915	246	779	21,878	10,580
1916	206	594	7,201	4,266
1917	1,519	3,221	11,206	7,841
1918	2	8	7,706	6,181
1919	16	76	61,338	53,553
1920	1,818	4,769	133,358	159,621
1921[b]	636	2,428	137,238	142,864

[a]Up to and including 1917, computations are for fiscal years ended June 30.
[b]First nine months only.

Review of the Crude Rubber Market

New York

DURING the past month the rubber market has been characterized by firmness. Spot first latex plantation showed a net advance from 18 cents to 20½ cents during the month while spot upriver fine Pará showed a decline of one cent which it reached and has held since December 8.

The week ended December 3 was one of the most active for a long time, prices on first latex advancing sharply about two cents in all positions and manufacturers showing much interest and factors entering the market as both buyers and sellers. Parás were steady and failed to show activity of plantation grades. Spot first latex and ribbed smoked sheet ruled at the same price which was 20½ to 20¾ cents.

During the week ended December 10 the market was fairly active in all positions. The principal feature was the continued strength of sterling exchange which rose from $4.05¾ to $4.13½, resulting in stiffening the price of rubber futures particularly. Manufacturers were placing orders freely in view of the strengthening prices. Dealers look for a steady market with strong rising tendency.

The week of December 17 was quiet with very steady prices and some factory buying, cheap lots of spot and near-by being sought. As high as 22 to 23 cents was reported paid for spot rubber in Chicago, while the New York prices were 20½ to 21 cents. Ambers and roll brown sold at prices out of proportion to their worth, 18 to 19 cents for the former and 18 cents for the latter. This is attributable to lessened production of low grades following the restriction of production in high grades. Factory buying lessened in view of the near approach of inventory period. Higher prices for spot and near-by are looked for early in the new year.

Importation of all grades during November were 19,738 tons compared with 6,448 tons last year. Plantation arrivals for November were 18,631 tons compared with 5,695 tons one year ago. Total imports of all grades for eleven months ended November 30, 1921, were 162,673 tons compared with 210,060 tons for the corresponding period in 1920.

Spot and future quotations on standard plantation and Brazilian grades were as follows:

PLANTATION. December 1. Spot, first latex crêpe, 20 cents; January-March, 21 cents; April-June, 22 cents; July-December, 23¾ cents. December, 23. Spot, first latex crêpe, 20¼-20½ cents; January-March, 21¼ cents; April-June, 22¼ cents; July-December, 24½ cents.

December 1. Spot, ribbed smoked sheets, 20 cents; January-March, 21 cents; April-June, 22 cents; July-December, 23¾ cents. December 23. Spot, ribbed smoked sheets, 20¼-20½ cents; January-March, 21¼ cents; April-June, 22¼ cents; July-December, 24½ cents.

December 1. Spot, No. 1 amber crêpe, 18¾ cents; January-March, 19½ cents. December 23. Spot, No. 1 amber crêpe, 19½ cents; January-March, 20 cents.

December 1. Spot, No. 1 rolled brown crêpe, 16½ cents; January-March, 17¼ cents. December 23. Spot, No. 1 rolled brown crêpe, 17¾ cents; January-March, 18¾ cents.

SOUTH AMERICAN PARÁS AND CAUCHO. December 1. Spot, upriver fine, 24 cents; islands fine, 21½ cents; upriver coarse, 15 cents; islands coarse, 10 cents; Cametá, 11 cents; caucho ball, 11½ to 11¾ cents. December 23. Spot, upriver fine, 22½-23 cents; islands fine, 23 cents; upriver coarse, 15-16 cents; islands coarse, 11 cents; Cametá, 11 cents; caucho ball, 11 to 14 cents.

New York Quotations

Following are the New York spot quotations, for one year and one month ago, and December 23, the current date:

	January 1, 1921	December 1, 1921	December 23, 1921
Plantation Hevea			
First latex crêpe	$0.16¾@	$0.20 @	$0.20½@
Off latex crêpe	@	.19 @	.20½@
Amber crêpe No. 1	.14 @	.19 @	.19½@
Amber crêpe No. 2	.13 @	.18½@	.19 @
Amber crêpe No. 3	.12 @	.18 @	.18½@
Brown crêpe, thick and thin	.10 @	.18½@	.18½@
Brown crêpe, specky	.09 @	.17½@	.18 @
Brown crêpe, rolled	.11 @	.16½@	.18 @
Smoked sheet, ribbed	.16 @	.20 @	.20½@
Smoked sheet, plain	.15 @	@	.19½@
Unsmoked sheet	.14 @	@	.19 @
Colombo scrap No. 1	.12 @	*.16½@	.16¾@
Colombo scrap No. 2	.11 @	*.14¾@	.15½@
East Indian			
Assam crêpe	@	@	@
Assam onions	@	@	@
Penang block scrap	@	@	@
Pontianak			
Banjermassin	@	.08¾@	.08¼@
Palembang	@	@	.09¾@
Pressed block	@	.11¾@	.13 @
Sarawak	.08 @	.06½@	.07 @
South American			
Parás			
Upriver, fine	.18 @.18½	.24 @	.22½@.23
Upriver, medium	.15 @.16	.21½@	.20 @.21
Upriver, coarse	.14 @	@	.15 @
Upriver, weak, fine	.14½@	.20 @	.21 @
Islands, fine	.18 @.18½	.20½@	.21 @
Islands, medium	.15 @	.18½@	.20 @
Islands, coarse	.11½@	.10½@	.11 @
Cametá	.12 @	.09½@.10½	.11 @
Acre Bolivian, fine	.18½@.19	.24 @.24½	.23 @
Madeira, fine	.23 @.24	.25 @.25½	.23½@
Beni Bolivian	@	.24 @.24½	.24 @
Peruvian, fine	.16 @.17	.22½@.23½	.21 @
Tapajos, fine	.17½@.18	.21½@.22½	.21 @
Parás—Washed and Dried (shipment from Brazil)			
Acre Bolivian fine (crêpe)	@	@	.33½@
Xingu fine (crêpe)	@	@	.31½@
Cametá (crêpe)	@	@	.21½@
Caucho			
Upper caucho ball	.14½@.15	.14 @	.14 @
Lower caucho ball	.10 @	.11½@.12½	.11½@.12¼
Manicobas			
Ceará negro heads	*.12 @	*.12 @	.12 @
Ceará scrap	*.06 @	*.08 @	.08 @
Manicoba, 30% guaranty	*.10 @	.09 @	.09 @
Mangabeira thin sheet	*.15 @	.15 @	.15 @
Centrals			
Corinto scrap	.12 @	.13½@.14½	.14 @.15
Central scrap	.12 @	.13½@.14½	.14 @.15
Central scrap and strip	.10 @	.12½@.13½	.13½@.14½
Central wet sheet	.08 @	.04½@.05½	.05½@.06½
Esmeralda sausage	.12 @	.13½@.14½	.14½@.15½
Guayule, 20% guaranty	*.20 @	@	@
Guayule washed and dried	*.30 @	.25 @.25½	.26 @
Africans			
Benguela, No. 1, 28½%	@	@	.08 @.10
Benguela, No. 2, 32½%	.06½@	@	.08 @.10
Conakry niggers	@	@	@
Congo prime, black upper	.14 @	@	@
Congo prime, red upper	.08 @	@	@
Kassai, black	@	@	.16 @
red	@	@	.12 @.13
Massai sheets and strings	@	@	@
Niger flake, prime	.15 @	@	.14 @
Rio Nunez ball	@	@	@
Rio Nunez sheets, strings	@	@	@
Gutta Percha			
Gutta Siak	.16 @.17	.16¼@.17	.18½@
Red Macassar	2.30 @3.00	2.75 @2.80	2.85. @
Balata			
Block, Ciudad Bolivar	.62 @	.58 @.59	.56 @
Colombia	.40 @	.48 @.48½	.43 @
Panama	.30 @.35	.47 @.47½	.40 @.43
Surinam sheet	.69 @	.71 @.71½	.69 @
amber	.75 @	.74 @.74½	.71 @

*Nominal.

Reclaimed Rubber

Early in the month the demand for reclaims was somewhat improved, falling off later, business at this season being naturally more or less restricted. Reclaimers are still feeling the depressing effect of competition in 20-cent crude rubber. At this time reclaiming plants generally are operating at 30 to 40 per cent of their capacity.

The outlook for business early in the new year is good, particularly for cheap reclaim grades. The quotations below are nominal:

New York Quotations

December 23, 1921

Prices subject to change without notice.

Standard Reclaims			
Floating	$0.12	@	$0.13
Friction	.12	@	.13
Mechanical	.09	@	.11
Shoe	.10½	@	.11
Tires, auto	.10½	@	.11
truck	.09	@	.11
White	.13	@	.14

Comparative Low and High New York Spot Rubber Prices

	December					
	1921*		1920		1919	
Plantations						
First latex crêpe	$0.18	@$0.21	$0.16¾	@$0.19½	$0.51	@$0.55
Smoked sheet, ribbed	.18¼	@ .21	.16	@ .18½	.51	@ .55
Paras						
Upriver, fine	.22¾	@ .24	.18	@ .20½	.47	@ .49
Upriver, coarse	.14	@ .15½	.14	@ .15	.35	@ .36½
Islands, fine	.21	@ .23	.18	@ .19	.46¾	@ .48¼
Islands, coarse	.10	@ .11	.11½	@ .14½	.21	@ .22
Cametá	.10	@ .12	.11¾	@ .14	.23	@ .23½

*Figured to December 24, 1921.

Antwerp Rubber Market

OSTERRIETH & CO., Antwerp, report under date of December 6, 1921:

Since our last report we have had a steady market all around and at one time the activity was rather intense, both the raw material and the exchange advancing; however, a drop in the dollar and sterling exchange soon intervened and if one considers to what a great extent our prices in francs are actually depending on foreign exchanges, it was not surprising that we had to register again a weakening in prices.

Although the German exchange experienced a turn for the better, the demand from that part has not shown much improvement so far. Congo were in comparatively good demand, especially rooty qualities, like Congo thimbles and Benguela, which, as we pointed out in our last report, are cheap and some 150 tons were taken out of the market at fr. 1.—for Congo thimbles.

We quote today: Prime red Kasai spindles, fr. 3.75. Red Loanda II, Sankuru, fr. 2.75/3.25. Congo thimbles, fr. 1.00/1.15.

We close at the following prices for our "futures" market:

	Crêpes, Francs per Kilo	Sheets, Francs per Kilo
December, 1921	6.10	6.10
January, 1922	6.15	6.20
February	6.20	6.20
March	6.25	6.20
April	6.30	6.25
May	6.35	6.30
June	6.40	6.35
July	6.40	6.40
August	6.40	6.40
September	6.40	6.40
October	6.40	6.40
November	6.40	6.40

Stock today: About 1,500 tons.

Amsterdam Rubber Market

JOOSTEN & JANSSEN, Amsterdam, report under date of December 2, 1921:

The course of the rubber market was quite the reverse from last week. The tone was firm and prices improved gradually. A large turnover resulted with increasing demand. The close was strong at top prices as follows:

Hevea crêpe, Fl. .60. Sheets, Fl. .61½ spot.
Hevea crêpe, Fl. .62½. Sheets, Fl. .63½ January to March.
Hevea crêpe, Fl. .64. Sheets, Fl. .65 April to June.

Singapore Rubber Market

GUTHRIE & CO., Limited, Singapore, report under date of November 10, 1921:

Early in the week the rubber market developed considerable activity consequent on a strong trade demand and values advanced 2 to 3 cents. There was a good attendance of buyers at the weekly auction yesterday, manufacturing interests being well represented. All grades were in strong demand and sellers catalogs were quickly cleared. Standard sheet sold from 34½ to 35½ cents, the latter figure being paid for two lots only. Standard and unawarded lots of fine pale crêpe sold freely at 34 cents, an advance of 2 cents on the week. Exceptionally good prices were obtainable for off-quality sheet and crêpe. Lower grades show an all around advance of 3 cents. The sale closed firm with a tendency to higher prices. Of 642 tons catalogd, 591 tons were sold. The following is the course of values:

	In Singapore per pound	Sterling Equivalent per pound in London
Sheet, fine ribbed smoked	34½ @ 35½	—/11⅜ @ —/11¾
Sheet, good F. A. Q.	33 @ 34½	—/11 @ —/11⅜
Sheet, off quality	26 @ 32½	—/ 9 @ —/10⅞
Crêpe, fine pale	34 @	—/11⅜ @
Crêpe, good pale	33 @ 34	—/11¼ @ —/11⅜
Crêpe, off quality	26½ @ 32½	—/ 9½ @ —/11¼
Crêpe, fine brown	27 @ 28½	—/ 9⅜ @ —/10⅛
Crêpe, good brown	22½ @ 26½	—/ 8¼ @ —/ 9½
Crêpe, dark	22½ @ 26½	—/ 8¼ @ —/ 9½
Crêpe, bark	22 @ 23½	—/ 8¼ @ —/ 8⅝

Plantation Rubber Exports from Java*

	September		Nine months Ended September 30	
	1920	1921	1920	1921
To Netherlands, *kilos*	319,000	289,000	3,451,000	4,638,000
Great Britain	1,193,000	328,000	6,298,000	6,399,000
Germany	.....	26,000	70,000	380,000
United States	656,000	1,760,000	10,161,000	7,494,000
Singapore	224,000	314,000	3,174,000	2,121,000
Japan	.....	.....	184,000	108,000
Australia	.....	.....	190,000	211,000
Other countries	26,000	24,000	68,000	84,000
Totals, *kilos*	2,418,000	2,741,000	23,596,000	21,435,000
Ports of origin:				
Tandjong Priok, *kilos*	1,041,000	1,068,000	10,964,000	9,495,000
Samarang	43,000	25,000	346,000	342,000
Soerabaya	1,283,000	1,377,000	11,532,000	9,871,000

*The August figures are verified.

British Malaya Rubber Exports

Notice comes from Singapore that, commencing with the return for October, the monthly returns of rubber exports cabled officially from that port, will include the figures for the whole of British Malaya instead of those of the Straits Settlements only.

The first cablegram of the new series dispatched from Singapore on Saturday last states that the exports for October amounted to 33,662,700 pounds with transhipments of 6,445,500 pounds.

An official report from Singapore states that 40,188,800 pounds of rubber (17,941 tons) were exported from British Malaya in the month of November, as against 33,662,700 pounds (15,028 tons) in October. Transshipments amounted to 2,973,800 pounds (1,328 tons), against 6,455,500 pounds (2,882 tons) in October.

New York Average Spot Rubber Prices

PRICES IN CENTS PER POUND

	November, 1921																					December, 1921		
	7	8*	9	10	11*	12	14	15	16	17	18	19	21	22	23	24*	25	26	28	29	30	1	2	3
PLANTATIONS																								
Sheet																								
Ribbed smoked	17	....	17⅝	18¼	....	18½	18½	18¼	17¾	17¼	18¼	18¼	18⅝	18⅝	18¼	....	18⅝	18⅝	19⅜	19⅝	20	20⅛	20¼	20¼
Crêpe																								
First latex	16⅞	....	17⅛	18¼	....	18¾	18½	18⅛	17¾	17⅝	18	18	18⅝	18¾	18¼	....	18½	18½	19¼	19⅝	20	20	20½	20½
Off latex	16¼	....	16⅜	17¾	....	17⅝	17¾	17½	17½	16¾	16¾	16¾	17⅜	17¾	17¼	....	17¾	17½	18⅜	19	19⅛	19	19½	19½
No. 1 blanket	16¼	....	16⅞	17¼	....	18½	18⅛	17¾	17¼	17¼	17¾	17⅜	17½	17⅛	17⅛	....	17½	17½	17⅜	18¼	18⅜	18¾	18¾	18¾
No. 2 blanket	15¾	....	16½	16¾	....	17½	17½	17⅛	16¾	16¾	16⅞	16⅞	17½	17⅛	17⅛	....	17	17	17½	17¾	18	18⅛	18¼	18¼
No. 3 blanket	15¼	....	15⅞	16½	....	16½	16¾	16⅝	16¼	16½	16¾	16⅜	16⅞	16⅞	16⅝	....	16⅝	16⅜	17	17¼	17½	17¾	17¾	17¾
Thin, clean, brown	15⅜	....	16½	16½	....	16½	17	16¾	16¼	16½	16½	16½	17	16¾	16¾	....	16¾	16¾	17¼	17¾	18	18¼	18¼	18¼
Specky brown	14⅞	....	15¼	15½	....	15¼	15¾	16	15½	15½	16	16	16¼	16¼	16¼	....	16¼	16¼	16½	16¾	17¼	17¼	17¼	17¼
Rolled brown	13⅝	....	14¼	14½	....	14¾	14¾	14⅝	14⅜	14⅜	14⅜	14¾	15	15⅛	15⅜	....	15⅜	15⅝	15¾	16¼	16½	16½	17¼	17⅝

*Holiday.

Ceylon Rubber Exports

	January 1 to October 25	
	1920	1921
To United Kingdom ..... pounds	35,748,868	24,640,071
Austria	.....	980
Belgium	169,550	254,384
France	698,713	340,300
Germany	409,472	3,253,539
Holland	22,730	374,281
Denmark	.....	51,610
Italy	230,720	104,160
Norway	2,240	2,240
Western Australia	56	.....
Victoria	286,836	127,390
New South Wales	438,092	115,000
United States	30,943,682	42,659,875
Canada and Newfoundland	425,600	419,148
India	2,176	9,379
Straits Settlements	44,800	14
Japan	204,730	314,896
Mauritius	.....	40
Totals ..... pounds	69,628,265	72,667,307

Compiled by the Ceylon Chamber of Commerce.

Plantation Rubber Exports from Malaya

(These figures include the production of the Federated Malay States, but not of Ceylon.)

	January 1 to September 30, 1921			January 1 to November 3, 1921 Port	
	Singapore	Malacca	Penang	Swettenham	Totals
To United Kingdom, pounds	37,146,499	3,119,353	25,658,732	14,774,216	80,698,800
The Continent..	8,855,510	1,739,485	253,366	169,292	11,017,653
Japan	33,976,151	.....	.....	37,575	34,013,706
Ceylon	44,627	.....	248,565	485,406	778,598
United States and Canada	129,402,118	376,840	3,613,333	.....	133,392,291
Australia	632,548	806	.....	.....	634,354
China (Hong Kong)	121,586	.....	.....	.....	121,586
Other countries..	30,746	.....	800,233	.....	839,979
Totals, pounds.	210,219,765	5,236,484	30,574,229	15,466,489	261,496,967

Compiled by Barlow & Co., Singapore.

CRUDE RUBBER ARRIVALS AT ATLANTIC PORTS AS STATED BY SHIPS' MANIFESTS

Paras and Caucho at New York

	Fine	Medium	Coarse	Caucho	Totals Pounds
NOVEMBER 19. By the S. S. "Sallust," from Manáos.					
Paul Bertuch	83,372	5,783	9,892	350	99,397
Meyer & Brown, Inc.	15,680*	.....	.....	.....	15,680
Fred Stern & Co....	.....	.....	4,624	1,831	6,455
NOVEMBER 19. By the S. S. "Sallust," from Pará.					
General Rubber Co.	.....	.....	.....	6,720	6,720
General Rubber Co...	.....	.....	.....	.....	†44,800
H. A. Astlett & Co...	60,000	10,000	1,500	.....	71,500
NOVEMBER 23. By the S. S. "Bonheur," from Manáos.					
General Rubber Co..	.....	.....	44,800	.....	44,800
Fred Stern & Co....	.....	.....	6,612	.....	6,612
NOVEMBER 23. By the S. S. "Bonheur," from Pará.					
Paul Bertuch.....	.....	6,850	.....	.....	6,850
H. A. Astlett & Co..	65,000	7,000	15,000	.....	87,000
NOVEMBER 27. By the S. S. "Sheridan," from Pará.					
Meyer & Brown, Inc.	42,560*	.....	.....	.....	42,560
NOVEMBER 29. By the S. S. "Polycarp," from Manáos.					
Paul Bertuch.....	6,700	3,158	5,984	.....	15,842
NOVEMBER 29. By the S. S. "Polycarp," from Pará.					
H. A. Astlett & Co..	20,000	5,000	10,000	5,000	40,000
DECEMBER 10. By the S. S. "Virgil," from Manáos.					
Paul Bertuch.....	22,921	.....	5,245	800	28,966
DECEMBER 10. By the S. S. "Virgil," from Pará.					
H. A. Astlett & Co..	50,000	15,000	.....	.....	65,000
Schafer & Meyer....	50,956	.....	11,373	.....	62,329
DECEMBER 11. By the S. S. "Hubert," from Pará.					
General Rubber Co..	.....	.....	.....	.....	†44,800
Meyer & Brown, Inc.	.....	.....	.....	5,040	5,040
Meyer & Brown, Inc.	.....	.....	.....	.....	†22,400
Schafer & Meyer....	26,228	.....	.....	33,060	59,288
Schafer & Meyer...	2,314	.....	15,428	.....	‡17,742
DECEMBER 11. By the S. S. "Hubert," from Manáos.					
Fred Stern & Co....	20,160	.....	6,720	.....	26,880

*Includes mellore.
†Cameta.
‡Washed and dried in Brazil.

Plantations

(Figured at 180 pounds net to the bale or case.)

	Shipment from:	Shipped to:	Pounds	Totals
NOVEMBER 15. By the S. S. "Bolton Castle" at New York.				
Schafer & Meyer.....	Singapore	New York	56,000	
H. Muehlstein & Co.....	Singapore	New York	132,300	
East Asiatic Co., Inc....	Singapore	New York	94,860	
Thornett & Fehr.....	Singapore	New York	178,020	
John D. Lewis.....	Singapore	New York	99,000	
Phelan, Borland & Fearons	Singapore	New York	30,240	
Pell & Dumont, Inc.....	Singapore	New York	135,000	
Charles T. Wilson Co., Inc.	Singapore	New York	253,300	
Poel & Kelly, Inc.....	Singapore	New York	212,040	
H. P. Winter & Co.....	Singapore	New York	18,000	
Mitsui & Co., Limited...	Singapore	New York	40,320	
Firestone Tire & Rubber Co.	Singapore	Akron	197,640	
Baring Bros.	Singapore	New York	199,800	
Schafer & Meyer.....	Singapore	New York	55,920	
Various	Singapore	New York	536,290	2,238,730
NOVEMBER 15. By the S. S. "Half Moon" at New York.				
Eastern Rubber Co.....	Belawan-Deli	Philadelphia	52,200	
Various	Belawan-Deli	New York	1,168,851	
Charles T. Wilson Co., Inc.	Singapore	New York	235,172	
Continental Rubber Co. of New York.....	Singapore	New York	22,400	
Various	Singapore	New York	162,643	
M. Muehlstein & Co....	Batavia	New York	216,000	
Various	Batavia	New York	91,660	
Raw Products Co.....	Soerabaya	New York	55,260	
H. Muehlstein & Co.....	Soerabaya	New York	50,400	
Fred Stern & Co.....	Soerabaya	New York	4,442	
John D. Lewis.....	Soerabaya	New York	26,460	
The Goodyear Tire & Rubber Co.	Soerabaya	Akron	452,520	2,538,011
NOVEMBER 19. By the S. S. "Tarantia" at New York.				
Charles T. Wilson Co., Inc.	London	New York	265,352	
L. Littlejohn & Co., Inc.	London	New York	575,599	
Various	London	New York	156,249	997,200
NOVEMBER 26. By the S. S. "Celtic Prince" at New York.				
F. R. Henderson & Co..	Penang	New York	80,640	
Edward Boustead & Co..	Penang	New York	36,000	
Various	Penang	New York	332,820	
I. T. Johnstone & Co....	Malacca	New York	178,200	
J. Aron & Co.....	Port Swet'n'm	New York	14,400	
Thornett & Fehr, Inc....	Medan	New York	27,000	
Firestone Tire & Rubber Co.	Singapore	Akron	252,000	
Dunlop Tire & Rubber Goods Co., Limited...	Singapore	Toronto	194,580	
Nat E. Berzen.....	Singapore	New York	55,800	
Poel & Kelly, Inc.....	Singapore	New York	47,340	
Fred Stern & Co.....	Singapore	New York	268,363	
East Asiatic Co., Inc....	Singapore	New York	30,240	
F. R. Henderson & Co...	Singapore	New York	55,800	
Continental Rubber Co. of New York.....	Singapore	New York	33,600	
Phelan, Borland & Fearons	Singapore	New York	96,660	
Habicht & Co.....	Singapore	New York	102,600	
Schafer & Meyer.....	Singapore	New York	22,440	
William H. Stiles & Co..	Singapore	New York	112,000	

United States Crude and Waste Rubber Imports for 1921 (by Months)

1921	Plantation	Parás	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Balata	Miscellaneous	Waste	Totals 1921	Totals 1920
January ..... tons	12,819	1,312	43	3	.....	.....	41	173	1,071	15,462	22,401
February	7,913	432	269	2	25	.....	25	216	37	8,919	33,984
March	12,241	1,794	377	1	.....	3	29	7	345	14,797	33,998
April	16,861	403	.....	5	.....	.....	64	226	7	17,566	24,957
May	9,127	1,570	.....	2	33	.....	40	186	41	10,999	28,666
June	12,361	1,091	.....	25	.....	.....	49	203	72	13,801	15,606
July	11,140	495	27	30	.....	.....	25	189	34	11,940	17,487
August	13,031	899	41	3	.....	.....	21	102	22	14,119	15,066
September	14,653	516	15	4	.....	.....	41	311	99	15,439	12,414
October	21,602	990	874	3	.....	.....	45	400	17	23,931	11,595
November	18,631	916	190	1	.....	.....	97	351	88	20,274	7,151
Totals, 11 months, 1921. tons	150,379	10,318	1,836	79	58	3	477	2,264	1,833	167,247	.....
Totals, 11 months, 1920....	187,256	17,240	3,822	702	1,005	35	539	8,113	4,613	.....	223,325

Compiled by The Rubber Association of America, Inc.

Plantations—*Continued*

	Shipment from:	Shipped to:	Pounds	Totals
Baird Rubber & Trading Co., Inc.	Singapore	New York	67,200	
Charles T. Wilson Co., Inc.	Singapore	New York	65,160	
Peninsular Trading Agency, Inc.	Singapore	New York	54,540	
H. P. Winter & Co.	Singapore	New York	27,000	
General Rubber Co.	Singapore	New York	1,008,000	
Various	Singapore	New York	319,857	
Meyer & Brown, Inc.	Far East	New York	44,800	
L. Littlejohn & Co., Inc.	Far East	New York	268,800	3,795,840
NOVEMBER 20. By the S. S. "Nieuw Amsterdam" at New York.				
L. Littlejohn & Co., Inc.	Rotterdam	New York	425,600	
Various	Rotterdam	New York	206,380	631,980
NOVEMBER 20. By the S. S. "Esther Dollar" at New York.				
Various	Belawan	New York	18,720	
Firestone Tire & Rubber Co.	Singapore	Akron	190,080	
Pennsylvania Rubber Co. of America	Singapore	Jeannette	268,740	
Baird Rubber & Trading Co., Inc.	Singapore	New York	156,800	
H. Muehlstein & Co.	Singapore	New York	144,000	
John D. Lewis	Singapore	New York	134,460	
L. Littlejohn & Co., Inc.	Far East	New York	470,400	
William H. Stiles & Co.	Singapore	New York	134,400	
Poel & Kelly, Inc.	Singapore	New York	54,720	
Fred Stern & Co.	Singapore	New York	448,202	
Pacific Trading Corporation of America	Singapore	New York	112,320	
Ajax Rubber Co., Inc.	Singapore	New York	18,360	
Phelan, Berland & Fearons	Singapore	New York	189,180	
American Trading Co.	Singapore	New York	147,960	
Continental Rubber Co. of New York	Singapore	New York	123,200	
Habicht & Co.	Singapore	New York	90,000	
Various	Singapore	New York	55,698	2,757,240
NOVEMBER 23. By the S. S. "Mesaba" at New York.				
Mitsui & Co., Limited	London	New York	22,320	
L. Littlejohn & Co., Inc.	London	New York	40,430	62,750
NOVEMBER 27. By the S. S. "Noordam" at New York.				
Various	Rotterdam	New York	344,520	344,520
NOVEMBER 28. By the S. S. "Maine" at New York.				
L. Littlejohn & Co., Inc.	London	New York	224,841	
Various	London	New York	1,414,239	1,639,080
DECEMBER 1. By the S. S. "Vennonia" at New York.				
Michelin Tire Co.	London	Milltown	131,766	
L. Littlejohn & Co., Inc.	London	New York	448,610	
Charles T. Wilson Co., Inc.	London	New York	120,607	
Various	London	New York	313,143	1,014,120
DECEMBER 2. By the S. S. "City of Oran" at New York.				
Union Trading Co.	Colombo	New York	24,120	
Meyer & Brown, Inc.	Colombo	New York	224,000	
General Rubber Co.	Colombo	New York	336,000	
Charles T. Wilson Co., Inc.	Colombo	New York	49,450	
Baird Rubber & Trading Co., Inc.	Colombo	New York	38,885	
Various	Colombo	New York	55,585	728,040
DECEMBER 2. By the S. S. "City of Oran" at Boston.				
Hood Rubber Co.	Ceylon	Watertown	33,720	33,720
DECEMBER 3. By the S. S. "Sommelsdyk" at New York.				
Various	Colombo	New York	325,585	
H. Muehlstein & Co.	Soerabaya	New York	54,953	
Various	Soerabaya	New York	104,280	
Fred Stern & Co.	Batavia	New York	44,987	
Firestone Tire & Rubber Co.	Batavia	New York	1,080	
Various	Batavia	New York	20,893	
Joosten & Jansen	Belawan-Deli	New York	141,247	
Eastern Rubber Co.	Belawan-Deli	Philadelphia	141,884	
Various	Belawan-Deli	New York	216,352	
Meyer & Brown, Inc.	Medan	New York	56,000	
L. Littlejohn & Co., Inc.	Java	New York	167,215	1,274,476
DECEMBER 4. By the S. S. "Valacia" at New York.				
Iaeger & Co.	London	New York	40,500	
Wm. Brandt's Sons & Co.	London	New York	9,540	
L. Littlejohn & Co., Inc.	London	New York	537,682	
Various	London	New York	102,218	689,940
DECEMBER 4. By the S. S. "Tuscan Prince" at New York.				
E. G. Curry & Co., Inc.	Singapore	New York	43,560	
H. Muehlstein & Co.	Singapore	New York	148,500	
Baird Rubber & Trading Co., Inc.	Singapore	New York	112,000	
Balfour, Williamson & Co.	Singapore	New York	58,680	
William H. Stiles & Co.	Singapore	New York	56,000	
L. Littlejohn & Co., Inc.	Far East	New York	168,000	
Charles T. Wilson Co., Inc.	Singapore	New York	22,400	
Schaefer & Meyer	Singapore	New York	33,600	
Thomas A. Desmond & Co.	Singapore	New York	101,520	
Poel & Kelly, Inc.	Singapore	New York	56,880	
Firestone Tire & Rubber Co.	Singapore	Akron	179,280	
Pennsylvania Rubber Co. of America	Singapore	Jeannette	67,140	
Meyer & Brown, Inc.	Singapore	New York	96,320	
Fred Stern & Co.	Singapore	New York	56,000	
Various	Singapore	New York	74,640	
Huth & Co.	Singapore	New York	18,900	
Latham & Co.	Singapore	New York	80,280	
Various	Singapore	New York	92,640	1,465,740
DECEMBER 5. By the S. S. "City of Canton" at New York.				
Baird Rubber & Trading Co., Inc.	Singapore	New York	190,400	
Continental Rubber Co. of New York	Singapore	New York	56,000	
General Rubber Co.	Singapore	New York	1,059,500	
L. Littlejohn & Co., Inc.	Singapore	New York	643,000	
Meyer & Brown, Inc.	Singapore	New York	237,440	
Fred Stern & Co.	Singapore	New York	504,124	
William H. Stiles & Co.	Singapore	New York	336,000	
Charles T. Wilson Co., Inc.	Singapore	New York	403,650	
Schaefer & Meyer	Singapore	New York	22,400	3,452,514
DECEMBER 5. By the S. S. "City of Canton" at Boston.				
Hood Rubber Co.	Far East	Watertown	100,800	100,800
DECEMBER 7. By the S. S. "Michigan" at New York.				
Michelin Tire Co.	London	Milltown	41,580	
Continental Rubber Co. of New York	London	New York	33,600	
Hood Rubber Co.	London	Watertown	26,424	
L. Littlejohn & Co., Inc.	London	New York	92,894	
Various	London	New York	205,462	399,960
DECEMBER 7. By the S. S. "Comeric" at Boston.				
Hood Rubber Co.	Ceylon	Watertown	29,200	29,200
DECEMBER 7. By the S. S. "Comeric" at New York.				
Baird Rubber & Trading Co., Inc.	Colombo	New York	10,080	
Continental Rubber Co. of New York	Colombo	New York	8,960	
General Rubber Co.	Colombo	New York	448,000	
Meyer & Brown, Inc.	Colombo	New York	224,000	
Charles T. Wilson Co., Inc.	Colombo	New York	89,600	
L. Littlejohn & Co., Inc.	Singapore	New York	201,600	982,240
DECEMBER 7. By the S. S. "Lorain" at New York.				
Firestone Tire & Rubber Co.	Singapore	New York	310,320	
Baird Rubber & Trading Co., Inc.	Singapore	New York	168,000	
William H. Stiles & Co.	Singapore	New York	168,000	
Charles T. Wilson Co., Inc.	Singapore	New York	89,800	
Poel & Kelly, Inc.	Colombo	New York	73,980	
Baird Rubber & Trading Co., Inc.	Colombo	New York	41,760	
Continental Rubber Co. of New York	Colombo	New York	11,200	
L. Littlejohn & Co., Inc.	Colombo	New York	168,000	
Fred Stern & Co.	Batavia	New York	63,251	
Poel & Kelly, Inc.	Batavia	New York	11,700	
Various	Batavia	New York	51,929	1,157,940
DECEMBER 7. By the S. S. "Rotterdam" at New York.				
Baird Rubber & Trading Co., Inc.	Amsterdam	New York	156,800	
Various	Rotterdam	New York	131,020	287,820
DECEMBER 8. By the S. S. "Bessie Dollar" at New York.				
Various	Shanghai	New York	1,070,100	1,070,100
DECEMBER 9. By the S. S. "Aquitania" at New York.				
Various	Southampton	New York	301,140	301,140
DECEMBER 9. By the S. S. "Amur Maru" at New York.				
Mitsui & Co., Limited	Singapore	New York	80,640	
Schafer & Meyer	Singapore	New York	22,400	
Thornett & Fehr, Inc.	Singapore	New York	193,140	
Baird Rubber & Trading Co., Inc.	Singapore	New York	56,000	
L. Littlejohn & Co., Inc.	Singapore	New York	302,840	
Fred Stern & Co.	Singapore	New York	67,410	
Hood Rubber Co.	London	Watertown	76,160	
Various	Singapore	New York	74,770	873,360
DECEMBER 11. By the S. S. "Westerdyk" at New York.				
L. Littlejohn & Co., Inc.	London	New York	487,055	
Meyer & Brown, Inc.	Rotterdam	New York	47,040	
Various	Rotterdam	New York	164,485	698,580
DECEMBER 11. By the S. S. "Naneric" at New York.				
General Rubber Co.	Colombo	New York	448,000	
Goschen & Cunliffe	Colombo	New York	154,800	
Whittall & Co. of Ceylon	Colombo	New York	285,120	
Poel & Kelly, Inc.	Colombo	New York	11,160	
Baird Rubber & Trading Co., Inc.	Colombo	New York	71,880	
L. Littlejohn & Co., Inc.	Colombo	New York	134,400	
Various	Colombo	New York	73,680	
Charles T. Wilson Co., Inc.	Singapore	New York	44,800	1,223,840

Plantations—*Continued*

	Shipment from:	Shipped to:	Pounds	Totals
DECEMBER 11. By the S. S. "Naneric" at Boston.				
Hood Rubber Co.	Ceylon	Watertown	94,120	94,120
DECEMBER 10. By the S. S. "West Calumb" at New York.				
Baird Rubber & Trading Co., Inc.	Singapore	New York	291,200	
Continental Rubber Co. of New York	Singapore	New York	24,640	
L. Littlejohn & Co., Inc.	Singapore	New York	766,080	
Charles T. Wilson Co., Inc.	Singapore	New York	337,074	
Fred Stern & Co.	Soerabaya	New York	27,192	
Meyer & Brown, Inc.	Batavia	New York	47,040	
General Rubber Co.	Tandjong Balei	New York	1,051,200	2,544,426
DECEMBER 11. By the S. S. "City of Benares" at New York.				
Baird Rubber & Trading Co., Inc.	Colombo	New York	25,000	
Continental Rubber Co. of New York	Colombo	New York	7,840	
General Rubber Co.	Colombo	New York	112,000	
L. Littlejohn & Co., Inc.	Colombo	New York	84,570	
Meyer & Brown, Inc.	Colombo	New York	392,000	
Charles T. Wilson Co., Inc.	Colombo	New York	48,050	669,460
DECEMBER 11. By the S. S. "City of Benares" at Boston.				
Hood Rubber Co.	Ceylon	Watertown	27,060	27,060
DECEMBER 11. By the S. S. "Truro City" at New York.				
Fred Stern & Co.	Liverpool	New York	60,968	60,968
DECEMBER 12. By the S. S. "West Inskip" at New York.				
L. Littlejohn & Co., Inc.	Singapore	New York	171,242	171,242
DECEMBER 13. By the S. S. "Montauk" at New York.				
L. Littlejohn & Co., Inc.	London	New York	114,730	
Continental Rubber Co. of New York	London	New York	22,400	
Hood Rubber Co.	London	Watertown	7,185	144,315
DECEMBER 13. By the S. S. "Port Lincoln" at New York.				
L. Littlejohn & Co., Inc.	London	New York	492,900	
Fred Stern & Co.	London	New York	89,600	582,500
DECEMBER 15. By the S. S. "Kendal Castle" at New York.				
Baird Rubber & Trading Co., Inc.	Singapore	New York	126,350	
Continental Rubber Co. of New York	Singapore	New York	44,800	
General Rubber Co.	Singapore	New York	504,000	
L. Littlejohn & Co., Inc.	Singapore	New York	1,103,209	
Meyer & Brown, Inc.	Singapore	New York	134,960	
Fred Stern & Co.	Singapore	New York	257,600	
William H. Stiles & Co.	Singapore	New York	6,720	
Charles T. Wilson Co., Inc.	Singapore	New York	66,390	2,244,029
DECEMBER 15. By the S. S. "Kendal Castle" at Boston.				
Hood Rubber Co.	Far East	Watertown	107,700	107,700
DECEMBER 16. By the S. S. "Knight Templar" at New York.				
Continental Rubber Co. of New York	Singapore	New York	145,600	
L. Littlejohn & Co., Inc.	Singapore	New York	1,344,400	
Fred Stern & Co.	Singapore	New York	200,538	
William H. Stiles & Co.	Singapore	New York	33,600	1,724,138

Africans

NOVEMBER 25. By the S. S. "Samland" at New York.				
Various	Antwerp	New York	64,515	64,515
NOVEMBER 27. By the S. S. "Finland" at New York.				
Various	Antwerp	New York	271,880	271,880
NOVEMBER 28. By the S. S. "Celtic" at New York.				
Fred Stern & Co.	Liverpool	New York	11,178	11,178
DECEMBER 9. By the S. S. "Collamer" at New York.				
Poel & Kelly, Inc.	Bordeaux	New York	462,730	462,730
DECEMBER 14. By the S. S. "Barbadian" at New York.				
Baird Rubber & Trading Co., Inc.	Liverpool	New York	11,200	11,200

Balata

NOVEMBER 20. By the S. S. "Tolca" at New York.				
Fromm & Co.	Cristobal	New York	1,950	1,950
NOVEMBER 22. By the S. S. "Lake Savus" at New York.				
William Schall & Co.	Paramaribo	New York	9,150	
Middleton & Co., Limited	Surinam	New York	1,254	
Various	Paramaribo	New York	1,650	12,054
NOVEMBER 22. By the S. S. "Mayaro" at New York.				
Boos & Co.	Cristobal	New York	15,750	
Ultramares Corporation	Cristobal	New York	15,300	
A. D. Straus & Co.	Cristobal	New York	19,500	50,550
NOVEMBER 25. By the S. S. "Turrialba" at New York.				
American Trading Co.	Cristobal	New York	1,800	1,800
NOVEMBER 28. By the S. S. "Nickerie" at New York.				
William Schall & Co.	Port au Prince	New York	6,000	6,000
DECEMBER 1. By the S. S. "Quilpue" at New York.				
Boldan & Van Sickel	Guayaquil	New York	17,825	17,825
DECEMBER 4. By the S. S. "Pastores" at New York.				
Ultramares Corporation	Cristobal	New York	10,462	10,462
DECEMBER 5. By the S. S. "Sixola" at New York.				
P. R. Rincones, Jr., Co.	Cristobal	New York	3,000	3,000
DECEMBER 7. By the S. S. "Granfos" at New York.				
A. M. Capen's Sons, Inc.	Col'mb'n Ports	New York	2,700	2,700
DECEMBER 8. By the S. S. "Maraval" at New York.				
Ultramares Corporation	C. Bolivar	New York	35,085	
G. Amsinck & Co., Inc.	Trinidad	New York	29,700	
Boos & Co.	Trinidad	New York	30,300	
Yglesias & Co.	Trinidad	New York	14,250	
Various	Trinidad	New York	102,165	211,500
DECEMBER 11. By the S. S. "Ulua" at New York.				
Ultramares Corporation	Cristobal	London	13,824	13,824
DECEMBER 14. By the S. S. "Elmac" at New York.				
Middleton & Co., Limited.	French Guiana	New York	27,226	27,226

Centrals

DECEMBER 9. By the S. S. "Algonquin" at New York.				
Various	San Domingo	New York	150	150

Gutta Siak

DECEMBER 4. By the S. S. "Tuscan Prince" at New York.				
Various	Singapore	New York	96,000	96,000

Pontianak

NOVEMBER 15. By the S. S. "Bolton Castle" at New York.				
L. Littlejohn & Co., Inc.	Singapore	New York	354,300	
William H. Stiles & Co.	Singapore	New York	16,200	
Various	Singapore	New York	165,900	536,400

CUSTOM HOUSE STATISTICS

New York

Imports

	October 1920 Pounds	October 1920 Value	October 1921 Pounds	October 1921 Value
UNMANUFACTURED—*free*				
Crude rubber				
From Belgium	44,550	$10,264	108,250	$17,889
Italy	.....	.....	157,000	26,389
Netherlands	51,546	24,993	5,869,263	873,258
England	143,246	43,648	5,424,777	864,100
Nicaragua	6,252	1,731	.....	.....
Mexico	10,712	1,835	.....	.....
Jamaica	1,900	982	.....	.....
Bolivia	375	145	.....	.....
Brazil	2,369,369	576,346	2,261,612	269,776
Colombia	22,054	6,214	80	16
Ecuador	2,887	560	.....	.....
Peru	50,629	13,705	.....	.....
Venezuela	19,525	8,819	.....	.....
British India	22,449	10,291	100,830	11,895
Straits Settlements	11,307,078	4,501,293	21,894,995	2,775,068
British East Indies	1,813,330	603,967	4,954,713	656,387
Dutch East Indies	3,556,174	1,455,579	4,234,406	777,768
Japan	.....	.....	629,076	78,476
Belgian Kongo	.....	.....	7,624	1,605
Totals	19,422,076	$7,260,372	45,642,616	$6,352,627
Balata	112,017	72,916	176,684	88,953
Jelutong (Pontianak)	308,022	36,697	273,585	20,730
Gutta percha	524,064	119,001	118,657	15,542
Totals	20,366,179	$7,488,986	46,211,542	$6,477,852
Rubber scrap and reclaimed	239,121	13,025	116,915	8,201
Totals, unmanufactured	20,605,300	$7,502,011	46,328,457	$6,486,053
Manufactures of rubber and gutta percha ..... *dutiable*	279,358	$237,124	257,263	$152,898
Chicle ..... *dutiable*	.....	$54,955	.....	$49,009

Exports

MANUFACTURED				
Automobile and other tires	.....	$2,973,950	.....	$1,217,052
Inner tubes	.....	321,962	.....	58,217
Belting, hose, and packing	.....	556,759	.....	246,147
Rubber boots and shoes. *pairs*	510,183	534,015	164,515	146,573
Soles and heels	.....	60,019	.....	23,843
Druggists' sundries	.....	105,607	.....	27,802
Other rubber manufactures	.....	462,021	.....	196,284
Totals, manufactured	.....	$5,014,333	.....	$1,915,918
Insulated wire	.....	$493,671	.....	$153,384
UNMANUFACTURED—*free*				
Rubber scrap and reclaimed	425,601	$48,582	582,794	$33,826

Foreign Exports

Crude rubber	1,008,721	$334,231	9,236	$1,700
Balata	41,320	17,219	193,721	93,372
Rubber scrap and reclaimed	4,500	705	.....	.....
Rubber manufactures	.....	3,107	.....	1,053
Rubber substitutes	44,250	14,632	.....	.....

Massachusetts

Imports

	October 1920 Pounds	October 1920 Value	October 1921 Pounds	October 1921 Value
UNMANUFACTURED—*free*				
Crude rubber				
From England	.....	.....	78,470	$7,035
Straits Settlements	7,000	$2,503	114,980	10,782
British East Indies	67,940	17,246	56,060	5,561
Totals	74,940	$19,749	249,510	$23,378
Rubber scrap and reclaimed	14,883	930	600	18
Totals, unmanufactured	89,823	$20,679	250,110	$23,396
Rubber manufactures.*dutiable*	.....	$2,217	.....	$3,408

Exports

MANUFACTURED				
Automobile and other tires	.....	$3,258	.....	.....
Inner tubes	.....	552	.....	$457
Belting, hose, and packing	.....	8,591	.....	277
Rubber boots and shoes.*pairs*	114,615	137,183	6,065	9,201
Soles and heels	.....	3,862	.....	183
Druggists' sundries	.....	12,245	.....	2,481
Other rubber manufactures	.....	13,144	.....	41,083
Totals, manufactured	.....	$178,835	.....	$53,682
Insulated wire	.....	$425	.....	$19
Rubber scrap and reclaimed	.....	.....	1,019	36

Buffalo

Imports

UNMANUFACTURED—*free*				
Crude rubber				
From England	17	$7	.....	.....
Canada	2,033	1,130	3,825	$174
Totals	2,050	$1,137	3,825	$174
Rubber scrap and reclaimed	44,478	1,348	65,482	1,693
Totals, unmanufactured	46,528	$2,485	69,307	$1,867
Rubber manufactures.*dutiable*	.....	$22,707	.....	$32,661

Exports

MANUFACTURED				
Automobile and other tires	.....	$118,503	.....	$12,303
Inner tubes	.....	15,424	.....	564
Belting, hose, and packing	.....	21,020	.....	6,314
Rubber boots and shoes.*pairs*	3,271	11,432	228	657
Soles and heels	.....	155	.....	101
Druggists' sundries	.....	7,057	.....	6,124
Other rubber manufactures	.....	67,942	.....	39,881
Totals manufactured	.....	$241,533	.....	$65,944
Insulated wire	.....	$9,486	.....	$3,137
Rubber scrap and reclaimed	253,274	39,025	111,455	10,761

Foreign Exports

Crude rubber	789,782	$174,907	1,137,248	$165,586
Balata	.....	.....	88	10
Jelutong (Pontianak)	30,000	3,360	34,000	3,830
Gutta percha	.....	.....	43,690	6,902
Chicle	461	147	80,956	35,662

Philadelphia

Imports

Rubber scrap and reclaimed	.....	.....	65,220	$1,318
Rubber manufactures.*dutiable*	.....	$36	.....	2,432

Exports

MANUFACTURED				
Automobile and other tires	.....	$10,043	.....	.....
Inner tubes	.....	600	.....	.....
Belting, hose, and packing	.....	25,073	.....	$2,712
Other rubber manufactures	.....	.....	.....	1,030
Totals, manufactured	.....	$35,716	.....	$3,742
Insulated wire	.....	$5,587	.....	.....
Rubber scrap and reclaimed	103,544	7,395	52,184	$2,035

New Orleans

Imports

UNMANUFACTURED—*free*				
Crude rubber				
From Nicaragua	2,000	$616	.....	.....
Totals, unmanufactured	2,000	$616	.....	.....
Rubber manufactures.*dutiable*	.....	.....	.....	$125

Exports

MANUFACTURED				
Automobile and other tires	.....	$167,971	.....	$6,943
Inner tubes	.....	16,354	.....	1,643
Belting, hose, and packing	.....	34,632	.....	2,404
Rubber boots and shoes.*pairs*	33,421	43,429	4,629	5,225
Soles and heels	.....	3,241	.....	696
Druggists' sundries	.....	265	.....	584
Other rubber manufactures	.....	5,201	.....	1,490
Totals, manufactured	.....	$271,093	.....	$18,985
Insulated wire	.....	.....	.....	$2,287

Ohio

Imports

	October 1920 Pounds	October 1920 Value	October 1921 Pounds	October 1921 Value
UNMANUFACTURED—*free*				
Rubber scrap and reclaimed	.....	.....	4,105	$123
Rubber manufactures.*dutiable*	.....	$109	.....	155

Exports

MANUFACTURED				
Automobile and other tires	.....	.....	.....	$7,064
Belting, hose, and packing	.....	.....	.....	73
Other rubber manufactures	.....	.....	.....	185
Totals, manufactured	.....	.....	.....	$7,322

San Francisco

Imports

UNMANUFACTURED—*free*				
Crude rubber				
From Straits Settlements	840,940	$174,758	45,800	$5,038
British East Indies	.....	.....	12,850	1,076
Dutch East Indies	.....	.....	42,564	5,282
Hongkong	.....	.....	460	96
Japan	22,400	6,224	.....	.....
Totals	863,340	$180,982	101,674	$11,492
Jelutong (Pontianak)	9,200	736	.....	.....
Totals, unmanufactured	872,540	$181,718	101,674	$11,492
Rubber manufactures.*dutiable*	.....	$473	.....	$111

Exports

MANUFACTURED				
Automobile and other tires	.....	$249,373	.....	$41,558
Inner tubes	.....	31,359	.....	802
Belting, hose, and packing	.....	122,941	.....	28,184
Rubber boots and shoes.*pairs*	4,426	5,160	5,430	6,774
Soles and heels	.....	18,341	.....	95
Druggists' sundries	.....	6,608	.....	2,575
Other rubber manufactures	.....	25,443	.....	5,721
Totals, manufactured	.....	$459,225	.....	$85,709
Insulated wire	.....	$4,986	.....	$2,688
Rubber scrap and reclaimed	.....	.....	66,000	1,605

Foreign Exports

Crude rubber	50	$50	.....	.....

Washington

Imports

UNMANUFACTURED—*free*				
Crude rubber				
From Canada	360	$98	.....	.....
Totals, unmanufactured	360	$98	.....	.....
Rubber manufactures.*dutiable*	.....	$30	.....	$46

Exports

MANUFACTURED				
Automobile and other tires	.....	$28,351	.....	$2,328
Inner tubes	.....	4,034	.....	3,317
Belting, hose, and packing	.....	3,967	.....	154
Rubber boots and shoes.*pairs*	1,125	2,844	744	2,295
Druggists' sundries	.....	189	.....	191
Other rubber manufactures	.....	1,920	.....	2,030
Totals, manufactured	.....	$41,305	.....	$10,315
Insulated wire	.....	$562	.....	$98
Rubber scrap and reclaimed	96,310	2,058	2,096	73

Foreign Exports

Crude rubber	.....	.....	1,000	$260

Chicago

Imports

Rubber scrap and reclaimed	27,744	$1,450	26,000	$325
Rubber manufactures.*dutiable*	.....	3,244	.....	4,588
Chicle .....*dutiable*	384,987	215,949	216,394	102,904

Michigan

Imports

Rubber scrap and reclaimed	30,515	$1,136	27,968	$717
Rubber manufactures.*dutiable*	.....	1,452	.....	684

Exports

MANUFACTURED				
Automobile and other tires	.....	$42,504	.....	$982
Inner tubes	.....	10,373	.....	128
Belting, hose, and packing	.....	13,767	.....	1,319
Rubber boots and shoes.*pairs*	5,851	20,557	826	2,608
Druggists' sundries	.....	883	.....	1,417
Other rubber manufactures	.....	18,784	.....	5,587
Totals, manufactured	.....	$106,868	.....	$12,041
Insulated wire	.....	$7,668	.....	$1,819
Rubber scrap and reclaimed	111,306	5,937	10,167	209

Foreign Exports

Rubber manufactures	.....	.....	.....	$47,528
Chicle	.....	.....	65,500	28,488

EXPORTS OF INDIA RUBBER MANUFACTURES AND INSULATED WIRE AND CABLE FROM THE UNITED STATES BY COUNTRIES DURING THE MONTH OF SEPTEMBER, 1921

EXPORTED TO—	Belting	Hose	Packing	Boots		Shoes		Soles and Heels	Automobile Tires				Druggists' Rubber Sundries	All Other Manufactures of Rubber	Totals	Insulated Wire and Cables
									Casings	Inner Tubes	Solid Tires	All Others				
	Value	Value	Value	Pairs	Value	Pairs	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value
EUROPE																
Austria											$95				$95	
Belgium		$54	$908						$8,027	$1,149		$18	$291	$4,069	14,516	$158
Bulgaria		14													14	
Denmark						12,852	$11,756	$282	8,984	895	892		110	446	23,365	100
Esthonia						47	69		4,316			100			4,485	
Finland	$325													87	412	276
France	2,359	267				6	8		12,604	328			2,344	38,705	56,615	6,149
Germany	1,130								412	97					1,669	
Greece		12							3,478	83				86	3,659	175
Iceland and Faroe Is.						2,064	2,319		982	56					3,337	205
Italy				36	$118	264	160		52					135	465	37,135
Lithuania														510	510	
Malta, Gozo and Cyprus Is.									988						988	
Netherlands	3,379	970	1,301			555	332	62	10,948	839		1,646	3,434	1,707	24,608	
Norway	951			120	249	49,690	36,801	381	26,489	1,572	2,741			919	70,103	
Poland and Danzig		694				50	37		12,303	1,987	248			214	15,483	
Portugal									920	59					979	
Rumania	1,629	366	56			984	929			176	750			49	3,955	
Spain		77						45	8,095	851	191	1,952		540	11,751	1,614
Sweden	134	216							41,252	1,736	430	462	443	3,120	47,793	109,430
Switzerland	373					19,528	16,712		249	72		575			18,281	
Turkey in Europe		12				3,094	2,353								2,365	440
England	293	4,193	7,104	7,885	13,513	3,870	3,372	1,148	299,996	48,291	15,847	469	23,918	94,397	512,445	9,598
Scotland			249	360	688	120	229						195	52	1,413	
Ireland																
TOTAL, EUROPE	$10,573	$6,875	$9,618	8,401	$14,568	93,124	$75,067	$1,918	$440,419	$58,081	$121,194	$5,222	$30,735	$145,036	$819,306	$166,470
NORTH AMERICA																
Bermuda	$175	$99	$75	17	$57	308	$347	$52						$49	$854	$574
British Honduras	16	12				1,566	1,663	30	$375	$5	$30		83		2,134	
Canada	2,923	4,929	4,018	3,397	12,721	3,065	6,164		23,947	2,814	9,329	2626	14,952	93,882	176,365	11,947
Costa Rica		983	27			125	155	773	317		15			205	2,475	102
Guatemala	456	940	260			843	1,202	1,196	6,313	633		300	34	877	12,211	27
Honduras		946				301	421	78	2,543	354	142		258	588	5,330	1,687
Nicaragua	567	275	348	1	8	161	243	440	64	135			9	2	2,091	490
Panama	2,498	719	221			4,759	3,731	2,245	9,839	686	1,518	1,776	552	1,068	24,853	766
Salvador		378	60					2,621	2,373	49	1,390				6,871	73
Mexico	25,510	18,139	28,634	11	35	13,025	10,250	6,852	79,152	7,152	2,572	4,239	3,870	20,800	207,185	20,595
Miquelon, Langley, etc.	916							29							945	
Newfoundland and Labrador	318	90	49	1,828	5,589	1,704	1,345	585	463	127	253	67	185	1,127	10,198	1,025
Barbados		7				96	115							34	156	
Jamaica		115	557	1	5	5,040	5,105		2,090	742	1,985	8	157	187	10,951	8,105
Trinidad and Tobago		142				1,044	1,505		9,613	697	2,463		259	206	14,885	235
Other British West Indies	526	35	32			2,125	1,396	43	792	74		425		8	3,331	64
Cuba	12	4,562	3,852			2,084	1,815	2,159	74,800	7,806	17,901	1,039	1,583	7,721	123,240	15,741
Virgin Islands of United States		20	35			542	710	98	579	287	760			138	2,627	
Dutch West Indies		43				329	439	380	1,325	173				32	2,383	
French West Indies		19							293		137			13	1,061	
Haiti		41						101	4,742	540		81	346	343	6,194	48
Dominican Republic	459	1,032	3,135			528	740	146	9,415	726	225	129	286	556	16,849	270
TOTALS NORTH AMERICA	$34,376	$33,526	$41,303	5,255	$18,415	37,645	$37,337	$17,808	$229,634	$23,000	$38,720	$8,680	$22,494	$127,836	$633,129	$61,750
OCEANIA																
Australia	$3,909	$501	$1,973	72	$249	2,308	$2,308		$6,177		$817	$10	$612	$2,980	$19,536	$5,433
New Zealand	839	1,500	854					$589	7,196	8671	1,229		$208	4,062	17,148	1,872
Other British Oceania						152	315		266	58	145				784	
French Oceania			126			94	227	40	797	58	206	20		45	1,519	17
Other Oceania						373	603		742				10	33	1,388	
Philippine Islands	2,591	1,586	162			648	577	1,322	33,518	1,933	8,820	4,925	1,673	8,372	65,479	3,740
TOTALS, OCEANIA	$7,339	$3,587	$3,115	72	$249	3,575	$4,030	$1,951	$48,696	$2,720	$11,217	$4,955	$2,503	$15,492	$105,854	$11,062
SOUTH AMERICA																
Argentina	$369	$2,770	$949			33,373	$30,829	$3,302	$55,223	$1,602	$5,040		$726	$4,519	$105,329	$6,058
Bolivia						102	90								90	
Brazil	4,297	89	421					1,672	27,806	127	893		482	582	36,369	3,803
Chile	970		50			96	302		2,550	393				1,169	5,334	3,075
Colombia	851	104	509			1,509	1,483	1,313	2,033	361		$166	103	873	8,096	4,103
Ecuador		28						306	1,115	290	487			10	2,236	
British Guiana						2,721	2,461		1,667	296	937				5,361	71
Dutch Guiana	112					336	458			131		530		38	1,269	
Peru		1,969	1,124			47	64	684	5,162	180	3,113		137	69	11,602	243
Uruguay		78	65			480	425		9,979	12				118	10,677	166
Venezuela	897	215	484					27	9,563	1,329			75	451	13,041	1,648
TOTALS, SOUTH AMERICA	$7,496	$4,353	$3,602			38,664	$36,012	$7,304	$115,098	$4,721	$10,470	$696	$1,823	$7,829	$199,404	$19,117

EXPORTED TO—	Belting Value	Hose Value	Packing Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Soles and Heels Value	Automobile Tires Casings Value	Automobile Tires Inner Tubes Value	Automobile Tires Solid Tires Value	Druggists' All Others Value	All Other Rubber Sundries Value	Manufactures of Rubber Value	Insulated Totals Value	Wire and Cables Value
ASIA																
Aden	......	......	......	......	......	......	......	......	......	......	......	$346	......	......	$346	......
China	$666	$1,036	$1,572	......	......	520	$365	......	$10,556	$1,169	$19	......	$3,084	$7,390	25,857	$4,206
Chosen	......	......	......	......	......	......	......	......	2,386	698	......	......	36	64	3,184	......
British India	156	1,309	380	......	......	10	25	......	2,030	169	5,147	......	......	1,429	10,645	100
Straits Settlements	......	......	......	......	......	264	299	......	5,784	411	8,779	......	26	......	15,299	......
Other Brit. East Indies	......	......	......	......	......	72	127	......	......	......	......	......	......	......	127	......
Dutch East Indies	......	326	161	......	......	61	48	......	31,545	3,718	1,408	......	......	1,170	38,376	206
Greece in Asia	......	......	......	......	......	......	......	......	539	47	......	......	......	50	636	......
Hejaz, Arabia, and Mesopotamia	......	......	......	......	......	......	......	......	......	253	......	5,576	......	......	5,829	......
Hongkong	476	1,788	......	......	......	192	158	......	7,911	13	......	......	448	235	11,029	75
Japan	......	748	3,747	32,599	$70,085	36,140	32,326	$736	16,279	1,407	569	686	219	28,852	155,654	5,699
Palestine and Syria	......	......	......	......	......	648	514	763	1,896	267	......	......	......	375	3,815	......
Russia in Asia	......	......	......	108	472	......	......	......	......	......	......	360	......	......	832	......
Siam	......	......	......	......	......	......	......	......	49	......	......	......	......	256	305	......
TOTALS, ASIA	$1,298	$5,207	$5,860	32,707	$70,557	37,907	$33,862	$1,499	$78,975	$8,152	$15,922	$6,968	$3,813	$39,821	$271,934	$10,286
AFRICA																
British West Africa	......	......	......	......	......	......	......	......	$5,792	$393	......	$53	......	$29	$6,267	......
British South Africa	$12,644	$4,690	$765	......	......	......	......	$161	11,932	208	......	......	$405	1,731	31,936	......
British East Africa	......	120	......	......	......	......	......	......	1,672	10	......	......	......	......	1,802	......
Canary Islands	......	......	......	......	......	......	......	......	3,134	......	......	......	......	......	3,134	......
Morocco	......	......	......	......	......	312	$305	......	1,000	211	......	......	......	......	1,516	......
Portuguese Africa	103	......	......	......	......	......	......	......	......	......	......	......	......	123	226	......
Egypt	......	......	......	......	......	......	......	417	3,981	32	......	......	......	396	4,826	$1,460
TOTALS, AFRICA	$12,747	$4,210	$765	......	......	312	$305	$578	$27,511	$854	......	$53	$405	$2,279	$49,707	$1,460
GRAND TOTALS	$73,829	$57,758	$64,263	46,435	$103,789	211,227	$186,613	$31,058	$940,333	$97,528	$97,523	$26,574	$61,773	$338,293	$2,079,334	$270,145

Exports of Rubber Goods to Non-Contiguous Territory of the United States

	Belting Hose, and Packing Value	Boots and Shoes Pairs	Boots and Shoes Value	Tires Automobile Value	Tires All Others Value	Druggists' Rubber Sundries Value	All Other Manufactures of Rubber Value	Totals Value	Insulated Wire and Cables Value
Hawaii	$8,483	......	......	$129,280	$677	....	$19,290	$157,730	......
Porto Rico	1,638	......	......	108,385	3,380	....	24,376	137,779	....
TOTALS	$10,121	......	......	$237,665	$4,057	....	$43,666	$295,509	....

Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.

OFFICIAL INDIA RUBBER STATISTICS FOR THE UNITED STATES

Imports of Crude and Manufactured Rubber

	September 1920 Pounds	September 1920 Value	September 1921 Pounds	September 1921 Value
UNMANUFACTURED—*free*				
India rubber				
From Netherlands	307,383	$141,036	1,362,870	$221,670
United Kingdom	947,073	338,454	5,123,590	744,497
Central America	4,124	901	....	....
Brazil	1,509,440	410,832	1,535,785	165,565
Peru	233,993	60,835	65,816	6,979
Other South Am.	135,633	36,990	4,712	1,350
British E. Indies	17,558,092	7,048,561	21,374,193	2,923,003
Dutch E. Indies	5,977,766	2,423,559	5,068,245	686,626
Other countries	1,210,244	496,686	11,200	844
Totals	27,883,748	$10,957,854	34,546,411	$4,750,534
Balata	894,115	$380,143	218,102	$123,890
Guayule	235,000	47,000	....	....
Jelutong (Pontianak)	466,480	72,155	250,456	14,866
Gutta percha	308,389	51,207	166,170	22,419
Rubber scrap	854,736	42,046	338,239	13,267
Totals, unmanufactured	30,642,468	$11,550,405	35,519,378	$4,924,976
India rubber and gutta percha ....*dutiable*	....	$245,017	....	$119,277
Chicle ....*dutiable*	257,938	170,774	286,765	136,980

Exports of Domestic Merchandise

	1920 Pounds	1920 Value	1921 Pounds	1921 Value
MANUFACTURED				
India rubber				
Scrap and old	506,420	$31,466	296,203	$14,613
Reclaimed	563,742	96,754	57,519	5,060
Belting[1]	....	258,065	....	73,829
Hose[1]	....	319,445	....	57,758
Packing[1]	....	136,375	....	64,263
Boots[1] ....*pairs*	26,489	92,216	46,435	103,789
Shoes[1] ....*pairs*	851,191	819,853	211,227	186,613
Soles and heels[1]	....	77,494	....	31,058
Tires				
Casings[1]	....	3,883,923	....	940,333
Inner tubes[1]	....	446,352	....	97,528
Solid tires[1]	....	271,572	....	97,523
All other tires[1]	....	78,597	....	26,574
Druggists' rubber sundries[1]	....	137,400	....	61,773
Other rubber manufactures[1]	....	613,921	....	338,293
Suspenders and garters	....	409,542	....	55,117
Totals, manufactured	....	$7,672,975	....	$2,154,124

Exports of Foreign Merchandise

	1920 Pounds	1920 Value	1921 Pounds	1921 Value
UNMANUFACTURED				
India rubber	1,238,648	$395,004	1,312,192	$231,916
Balata	17,920	13,762	122,750	36,354
Jelutong (Pontianak)	2,240	582	....	....
Totals, unmanufactured	1,258,808	$409,348	1,434,942	$268,270
MANUFACTURED				
Gutta percha and india rubber	....	$2,866	....	$8,357
Totals, manufactured	....	$2,866	....	$8,357

Exports of Rubber Goods to Non-Contiguous Territories of the United States

	1920 Pounds	1920 Value	1921 Pounds	1921 Value
MANUFACTURED				
To Alaska				
Belting, hose, and packing	....	$8,708	....	$2,638
Boots and shoes..*pairs*	5,153	17,001	7,505	21,804
Other rubber goods	....	10,221	....	7,871
Totals	....	$35,930	....	$32,313
To Hawaii				
Belting, hose, and packing	....	$10,262	....	$8,483
Automobile tires	....	88,807	....	129,280
Other tires	....	3,742	....	677
Other rubber goods	....	12,992	....	19,290
Totals	....	$115,803	....	$157,730
To Porto Rico				
Belting, hose, and packing	....	$7,400	....	$1,638
Automobile tires	....	75,107	....	108,385
Other tires	....	2,358	....	3,380
Other rubber goods	....	31,251	....	24,376
Totals	....	$116,116	....	$137,779

[1]Details of exports of domestic merchandise by countries during September, 1921, appear on this and the preceding page.

EXPORTS OF INDIA RUBBER MANUFACTURES AND INSULATED WIRE AND CABLE FROM THE UNITED STATES BY COUNTRIES DURING THE MONTH OF OCTOBER, 1921

EXPORTED TO—	Belting Value	Hose Value	Packing Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Soles and Heels Value	Automobile Tires: Casings Value	Automobile Tires: Inner Tubes Value	Automobile Tires: Solid Tires Value	Automobile Tires: All Others Value	Druggists' Rubber Sundries Value	All Other Manufactures of Rubber Value	Totals Value	Insulated Wire and Cables Value
EUROPE																
Austria	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	$216	$216	.....
Azores, etc., Islands	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	121	121	.....
Belgium	$1,898	$68	$97	126	$387	552	$394	.....	$2,453	$500	.....	$6,793	$198	1,576	14,364	$108
Czechoslovakia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	81	81	.....
Denmark	.....	.....	375	.....	.....	12,317	15,596	$582	43,899	2,241	$1,592	396	317	4,187	69,185	565
Finland	2,212	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,212	.....
France	183	612	554	.....	.....	.....	.....	.....	143,335	110	.....	.....	2,647	14,523	161,964	11,430
Germany	.....	.....	.....	.....	.....	.....	.....	.....	.....	49	.....	.....	.....	150	199	.....
Greece	.....	.....	.....	.....	.....	.....	.....	.....	5,096	334	.....	.....	.....	48	5,478	.....
Iceland and Faroe Is.	.....	.....	.....	.....	.....	3,086	3,000	.....	250	.....	.....	.....	.....	.....	3,250	.....
Italy	.....	120	.....	66	277	.....	.....	.....	872	.....	.....	.....	.....	274	1,543	1,207
Jugoslavia	.....	.....	.....	.....	.....	.....	.....	.....	300	57	.....	.....	.....	174	531	.....
Latvia	.....	.....	.....	.....	.....	.....	.....	.....	47	.....	.....	.....	.....	.....	47	.....
Lithuania	.....	.....	.....	.....	.....	.....	.....	.....	1,214	202	.....	.....	.....	.....	1,416	.....
Netherlands	3,044	123	.....	.....	.....	.....	.....	.....	5,267	60	364	248	1,620	2,072	12,798	.....
Norway	448	.....	.....	.....	.....	7,828	6,434	1,038	13,764	658	744	.....	.....	2,674	25,760	181
Poland and Danzig	.....	.....	.....	.....	.....	.....	.....	.....	1,478	388	.....	.....	.....	.....	1,866	.....
Portugal	.....	668	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	668	208
Rumania	.....	.....	.....	.....	.....	.....	.....	.....	.....	125	.....	.....	.....	.....	125	.....
Spain	.....	.....	.....	.....	.....	3,463	2,103	.....	39,618	437	.....	.....	20	602	42,780	235
Sweden	.....	.....	.....	.....	.....	.....	.....	.....	29,759	823	520	.....	.....	129	31,231	.....
Switzerland	.....	.....	.....	.....	.....	10,764	7,115	.....	65,985	235	.....	65	.....	1,389	67,674	.....
Turkey in Europe	.....	.....	.....	.....	.....	.....	.....	.....	384	101	.....	.....	.....	.....	7,600	.....
England	648	12,009	1,386	3,119	5,616	50,441	34,112	1,024	254,765	19,341	4,015	600	18,686	136,183	488,385	14,912
Scotland	.....	157	.....	.....	.....	4,500	2,746	.....	160	.....	.....	.....	.....	207	3,270	.....
Ireland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	295	295	6,200
TOTALS, EUROPE	$8,433	$13,757	$2,412	3,311	$6,280	92,951	$71,500	$2,644	$608,646	$25,661	$7,235	$8,162	$23,488	$164,901	$943,059	$35,046
NORTH AMERICA																
Bermuda	$254	$624	$35	14	$45	643	$853	$68	.....	.....	.....	$281	$189	$626	$2,975	$151
British Honduras	.....	.....	.....	.....	.....	1,511	1,657	25	$515	$30	.....	.....	167	24	2,418	33
Canada	4,883	7,224	5,398	1,790	6,520	1,758	4,529	503	11,876	1,260	$14,027	1,639	19,058	94,327	171,244	9,581
Costa Rica	297	.....	120	.....	.....	12	31	305	324	21	424	.....	15	16	1,553	42
Guatemala	329	367	.....	.....	.....	489	371	.....	1,372	23	.....	574	1	611	3,648	.....
Honduras	62	400	265	.....	.....	24	21	728	1,143	76	403	.....	321	310	3,729	1,547
Nicaragua	421	127	163	264	553	54	121	268	1,083	54	.....	.....	8	81	2,879	768
Panama	57	337	261	.....	.....	4,066	3,750	2,055	4,972	902	1,250	169	646	2,032	16,431	2,925
Salvador	50	25	67	.....	.....	.....	.....	.....	6,372	60	1,382	.....	.....	30	7,985	308
Mexico	9,153	19,340	10,116	23	190	7,354	6,935	5,221	35,287	4,195	1,984	895	1,048	18,060	112,424	28,248
Miquelon, etc.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11	11	.....
Newfoundland and Labrador	.....	86	.....	1,425	4,389	4,535	2,464	2,404	269	24	.....	.....	55	1,439	11,130	862
Barbados	.....	.....	.....	.....	.....	280	358	.....	2,046	130	770	.....	.....	43	3,347	58
Jamaica	213	78	46	.....	.....	8,904	10,124	.....	4,944	419	455	499	316	1,144	18,238	2,446
Trinidad and Tobago	.....	421	321	.....	.....	1,582	1,589	.....	12,982	1,562	1,365	.....	.....	217	18,457	664
Other British West Indies	.....	72	.....	.....	.....	4,752	5,578	114	838	82	.....	266	.....	107	7,057	53
Cuba	1,150	6,519	2,854	.....	.....	1,314	2,002	8,882	114,748	12,695	23,624	1,845	1,368	7,221	182,908	16,600
Virgin Islands of United States	.....	100	.....	.....	.....	941	1,272	149	2,028	151	.....	.....	60	107	3,867	.....
Dutch West Indies	.....	21	30	.....	.....	1,033	1,046	.....	1,746	248	.....	.....	.....	28	3,119	.....
French West Indies	.....	.....	.....	.....	.....	.....	.....	.....	3,396	1,033	129	.....	.....	.....	4,558	.....
Haiti	.....	.....	.....	.....	.....	200	360	.....	3,434	351	.....	210	32	815	5,202	241
Dominican Republic	179	270	894	.....	.....	4,221	5,361	418	3,826	447	59	427	104	1,314	13,299	293
TOTALS, NORTH AMERICA	$17,048	$36,011	$20,570	3,516	$11,697	43,673	$48,422	$21,140	$213,201	$23,763	$45,871	$6,805	$23,388	$128,563	$596,479	$64,820
OCEANIA																
Australia	$4,666	$564	$2,150	.....	.....	.....	.....	.....	$7,153	$324	$4,324	$953	$1,111	$2,523	$23,768	$14,532
New Zealand	3,255	477	245	200	$1,068	.....	.....	$280	19,937	119	71	.....	.....	550	26,002	1,862
Other British Oceania	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	50	.....	50	.....
Other Oceania	.....	.....	.....	.....	.....	144	$305	.....	63	.....	.....	26	.....	23	417	.....
Philippine Islands	1,808	2,268	2,007	12	65	4,988	5,824	.....	31,385	1,390	5,391	2,906	155	3,506	56,705	2,627
TOTALS, OCEANIA	$9,729	$3,309	$4,402	212	$1,133	5,132	$6,129	$280	$58,538	$1,833	$9,786	$3,885	$1,316	$6,602	$106,942	$19,021
SOUTH AMERICA																
Argentina	$1,333	$2,424	$186	.....	.....	4,268	$3,325	$1,603	$92,240	$3,857	$1,882	.....	$130	$9,208	$116,187	$2,178
Bolivia	.....	10	.....	.....	.....	12	28	.....	800	175	.....	.....	.....	.....	1,013	120
Brazil	3,360	747	1,312	.....	.....	.....	.....	643	7,397	13	382	.....	.....	536	14,390	13,660
Chile	6,547	224	214	.....	.....	.....	.....	.....	4,160	1,479	1,054	.....	.....	1,732	15,410	4,497
Colombia	525	655	71	12	$35	718	993	307	5,075	543	887	$129	725	404	10,349	4,481
Ecuador	.....	150	.....	.....	.....	.....	.....	23	2,078	260	.....	.....	192	.....	2,703	122
British Guiana	.....	.....	184	.....	.....	.....	.....	.....	902	133	.....	.....	.....	64	1,283	1,350
Dutch Guiana	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	14
French Guiana	.....	51	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	51	.....
Peru	82,781	328	31	.....	.....	84	81	.....	10,521	350	2,445	.....	.....	1,522	98,259	2,625
Uruguay	.....	.....	119	.....	.....	144	116	1,252	17,479	800	.....	.....	.....	1,734	21,500	.....
Venezuela	822	528	268	.....	.....	.....	.....	1,846	8,898	1,476	20	261	444	553	15,116	2,386
TOTALS, SOUTH AMERICA	$95,368	$5,117	$2,385	12	$35	5,226	$4,543	$5,673	$149,550	$9,286	$6,670	$390	$1,491	$15,753	$296,261	$31,433

TOTALS, SOUTH AMERICA $95,368 $5,117 $2,385 12 $35 5,226 $4,543 $5,673 $149,550 $9,286 $6,670 $390 $1,491 $15,753 $296,261 $31,433

	Belting Value	Hose Value	Packing Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Soles and Heels Value	Automobile Tires: Casings Value	Automobile Tires: Inner Tubes Value	Automobile Tires: Solid Tires Value	Automobile Tires: All Others Value	Druggists' Rubber Sundries Value	All Other Manufactures of Rubber Value	Totals Value	Insulated Wire and Cables Value
ASIA																
Aden	....	....	....	....	....	....	....	....	$1,328	....	....	....	....	....	$1,328	....
China	....	$5,832	$560	16	$28	....	....	....	7,863	$332	$2,376	....	$840	$6,847	24,678	$1,165
Chosen	....	....	341	....	....	....	....	....	132	....	....	....	....	....	473	....
British India	$9,697	2,273	1,029	....	....	1,361	$1,787	....	86,663	301	50,294	$17	91	560	152,712	14,070
Straits Settlements	....	....	....	....	....	....	....	....	9,462	1,757	5,052	....	26	299	16,596	....
Other British East Indies	....	....	....	....	....	....	....	....	281	....	....	....	....	65	346	....
Dutch East Indies	44	....	1,550	....	....	....	....	....	29,963	1,413	2,279	....	....	1,332	36,581	1,750
French East Indies	....	....	....	....	....	....	....	....	2,960	....	....	....	....	26	2,986	....
Far Eastern Republic	....	....	....	16	28	298	281	....	....	....	....	....	....	....	309	....
Greece in Asia	....	30	....	....	....	....	....	....	....	....	189	....	....	....	219	....
Hongkong	....	....	....	....	....	72	32	....	6,144	190	1,670	....	85	1,333	9,454	....
Japan	....	1,229	14,105	3,647	7,815	36,461	36,709	....	11,808	3,303	3,893	1,860	1,494	17,610	99,826	9,193
Palestine and Syria	....	....	....	....	....	195	169	....	4,671	1,533	432	....	....	345	7,150	....
Russia in Asia	....	....	....	168	690	144	360	....	....	....	....	....	....	33	1,083	....
Siam	150	....	....	....	....	....	....	....	682	53	....	....	24	402	1,311	....
Turkey in Asia	....	....	....	....	....	....	....	....	....	....	....	....	15	....	15	....
TOTALS, ASIA	$9,891	$9,364	$17,585	3,847	$8,561	38,531	$39,338	....	$161,957	$8,882	$66,185	$1,877	$2,575	$28,852	$355,067	$26,178
AFRICA																
Belgian Congo	$4,522	....	....	....	....	....	....	....	....	....	....	....	....	....	$4,522	$210
British West Africa	....	....	....	....	....	....	....	....	$1,168	$121	....	....	....	....	1,289	....
British South Africa	26,469	$14,106	$3,745	210	$676	1,229	$1,523	$2,712	22,409	643	$402	....	$298	$5,704	78,687	598
British East Africa	....	....	....	....	....	....	....	....	8,261	530	....	....	....	86	8,877	230
Portuguese Africa	1,578	....	335	....	....	....	....	....	....	....	....	....	....	....	1,913	....
Canary Islands	....	....	....	....	....	312	305	....	5,136	675	....	....	....	24	6,140	....
Egypt	....	....	....	....	....	....	....	97	10,723	136	....	$15	800	541	12,312	....
TOTALS, AFRICA	$32,569	$14,106	$4,080	210	$676	1,541	$1,828	$2,809	$47,697	$2,105	$402	$15	$1,098	$6,355	$113,740	$1,038
GRAND TOTALS	$173,038	$81,664	$51,434	11,108	$28,382	187,054	$171,760	$32,546	$1,239,589	$71,530	$136,149	$21,074	$53,356	$351,026	$2,411,548	$177,536

Exports of Rubber Goods to Non-Contiguous Territory of the United States

	Belting, Hose and Packing Value	Boots and Shoes Pairs	Boots and Shoes Value	Tires: Automobile Value	Tires: All Others Value	Druggists' Rubber Sundries Value	All Other Manufactures of Rubber Value	Totals Value	Insulated Wire and Cables Value
Hawaii	$5,412	....	....	$122,720	$1,422	....	$20,950	$150,504	....
Porto Rico	4,557	....	....	93,829	283	....	34,758	133,427	....
TOTALS	$9,969	....	....	$216,549	$1,705	....	$55,708	$283,931	....

Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.

OFFICIAL INDIA RUBBER STATISTICS FOR THE UNITED STATES

Imports of Crude and Manufactured Rubber

October	1920 Pounds	1920 Value	1921 Pounds	1921 Value
UNMANUFACTURED—*free*				
India rubber				
From Netherlands	51,546	$24,993	5,869,263	$873,258
United Kingdom	143,263	43,655	5,503,247	871,135
Canada	2,393	1,228	3,825	174
Central America	8,252	2,347	....	....
Mexico	10,712	1,835	....	....
Brazil	2,369,369	576,346	2,261,612	269,776
Peru	50,629	13,705	....	....
Other South Am.	44,841	15,738	80	16
British East Indies	14,143,006	5,333,778	28,734,896	3,772,554
Dutch East Indies	3,623,229	1,487,785	4,276,970	783,050
Other countries	68,850	17,470	992,410	124,455
Totals	20,516,090	$7,518,880	47,642,303	$6,694,418
Balata	112,017	72,916	176,684	88,953
Guayule	270,000	54,000	....	....
Jelutong (Pontianak)	317,222	37,433	273,585	20,730
Gutta percha	524,064	119,001	118,657	15,542
Rubber scrap	397,231	18,304	318,240	12,880
Totals, unmanufactured	22,136,624	$7,820,534	48,529,469	$6,832,523
Chicle .... *dutiable*	665,368	$453,963	474,007	$255,961
MANUFACTURED—*dutiable*				
India rubber and gutta percha	....	$87,883	....	$95,186
India rubber substitutes	15,620	3,385	....	....

Exports of Domestic Merchandise

	1920 Pounds	1920 Value	1921 Pounds	1921 Value
MANUFACTURED				
India rubber				
Scrap and old	836,556	$63,789	814,192	$42,150
Reclaimed	234,872	47,168	123,100	13,951
Belting[1]	....	283,958	....	173,038
Hose[1]	....	399,624	....	81,664
Packing[1]	....	182,976	....	51,434
Boots[1] .... *pairs*	24,962	82,970	11,108	28,382
Shoes[1] .... *pairs*	666,948	699,174	187,054	171,760
Soles and heels[1]	....	86,780	....	32,546
Tires				
Casings[1]	....	3,789,819	....	1,239,589
Inner tubes[1]	....	459,490	....	71,530
Solid tires[1]	....	167,332	....	136,149
All other tires[1]	....	72,033	....	21,074
Druggists' rubber sundries[1]	....	156,184	....	53,356
Other rubber manufactures[1]	....	700,494	....	351,026
Suspenders and garters	....	316,072	....	66,520
Totals, manufactured	....	$7,507,863	....	$2,534,169
Fountain pens ...... *number*	56,276	$63,191	11,068	$7,674
Insulated wire and cables	....	575,041	....	177,536

Exports of Foreign Merchandise

	1920 Pounds	1920 Value	1921 Pounds	1921 Value
UNMANUFACTURED				
India rubber	1,843,360	$517,219	1,419,324	$205,141
Balata	41,320	17,219	193,839	93,392
Jelutong (Pontianak)	30,000	3,360	234,063	31,015
Rubber scrap	4,500	705	....	....
Totals, unmanufactured	1,919,180	$538,503	1,847,226	$329,548
MANUFACTURED				
Gutta percha and india rubber	....	$3,228	....	$48,646
India rubber substitutes	44,250	14,632	....	....
Totals, manufactured	....	$17,860	....	$48,646
Chicle	161	$147	146,456	$64,150

Exports of Rubber Goods to Non-Contiguous Territories of the United States

	1920 Pounds	1920 Value	1921 Pounds	1921 Value
MANUFACTURED				
To Alaska				
Belting, hose, and packing	....	$7,730	....	$2,308
Boots and shoes.... *pairs*	12,082	24,142	3,001	7,747
Other rubber goods	....	4,825	....	2,560
Totals	....	$36,697	....	$12,615
To Hawaii				
Belting, hose, and packing	....	$34,145	....	$5,412
Automobile tires	....	147,748	....	122,720
Other tires	....	5,764	....	1,422
Other rubber goods	....	26,442	....	20,950
Totals	....	$214,099	....	$150,504
To Porto Rico				
Belting, hose, and packing	....	$77,747	....	$4,557
Automobile tires	....	139,299	....	93,829
Other tires	....	635	....	283
Other rubber goods	....	85,050	....	34,758
Totals	....	$232,731	....	$133,427

[1]Details of exports of domestic merchandise by countries during October, 1921, appear on this and the preceding page.

Imports of Crude Rubber Into the United States by Customs Districts

Customs Districts	November, 1921 Pounds	Value
Massachusetts	485,967	$52,706
New York	50,989,243	7,614,637
San Francisco	254,860	33,937
Washington	1,114	1,381
Totals	51,731,184	$7,702,661

RUBBER STATISTICS FOR THE DOMINION OF CANADA

Imports of Crude and Manufactured Rubber

	September 1920 Pounds	Value	1921 Pounds	Value
UNMANUFACTURED—*free*				
Rubber, gutta percha, etc.				
From United Kingdom	932,357	$469,416	52,193	$5,890
United States	774,341	236,986	1,029,137	155,488
Belgium	.....	.....	27,731	1,409
British East Indies—				
Ceylon	14,442	5,484	.....	.....
Straits Settlements	1,338,847	648,735	54,121	7,790
Total	3,059,987	$1,360,621	1,163,182	$170,577
Rubber, recovered	215,488	35,590	53,607	6,310
Rubber, powdered, and rubber or gutta percha scrap	526,972	51,402	42,749	4,157
Rubber substitutes	139,682	19,474	40,076	6,110
Totals, unmanufactured	3,942,129	$1,467,087	1,299,614	$187,154
PARTLY MANUFACTURED—				
Hard rubber sheets and rods	3,463	$2,535	297	$368
Hard rubber tubes	.....	2,492	.....	1,081
Rubber thread, not covered	1,698	2,382	3,813	4,885
Totals, partly manufactured	5,161	$7,399	4,110	$6,334
MANUFACTURED—				
Belting	.....	$11,006	.....	$6,114
Hose	.....	8,498	.....	11,435
Packing	.....	8,205	.....	5,577
Boots and shoes	.....	50,238	.....	14,274
Clothing, including waterproofed	.....	16,129	.....	16,489
Gloves	.....	1,264	.....	1,109
Hot-water bottles	.....	2,169	.....	523
Tires, solid	.....	16,036	.....	16,946
Tires, pneumatic	.....	140,825	.....	60,615
Inner tubes	.....	16,174	.....	7,654
Elastic, round or flat	.....	40,530	.....	27,510
Mats and matting	.....	239	.....	4
Cement	.....	2,880	.....	2,722
Other rubber manufactures	.....	136,069	.....	78,104
Totals, manufactured	.....	$450,262	.....	$249,076
Totals, rubber imports	3,947,290	$1,924,748	1,303,724	$442,564
Insulated wire and cables—				
Wire and cables covered with cotton, linen, silk, rubber, etc.	.....	$12,581	.....	$8,923
Copper wire and cables, covered as above	.....	28,901	.....	13,658
Chicle	.....	.....	55,626	25,641
Fillets	.....	713	.....	484
Webbing	.....	47,002	.....	27,195
Fountain pens	.....	3,685	.....	2,978

Exports of Domestic and Foreign Rubber Goods

	September 1920 Produce of Canada Value	Reexports of Foreign Goods Value	1921 Produce of Canada Value	Reexports of Foreign Goods Value
UNMANUFACTURED—				
Crude and waste rubber	$13,896	.....	$4,993	$100
MANUFACTURED—				
Belting	$3,675	.....	$749	.....
Hose	18,176	.....	7,983	.....
Boots and shoes	99,064	$384	81,988	75
Clothing, including waterproofed	2,562	.....	317	213
Tires, pneumatic	1,028,458	.....	203,593	.....
Tires	946	4,644	2,555	996
Other manufactures	46,034	5,649	7,268	1,319
Totals, manufactured	$1,198,915	$10,677	$304,453	$2,603
Total rubber exports	$1,212,811	$10,677	$309,446	$2,703

UNITED KINGDOM RUBBER STATISTICS

Imports

	October 1920 Pounds	Value	1921 Pounds	Value
UNMANUFACTURED				
Crude rubber				
From—				
Straits Settlements	8,011,000	£602,390	2,507,300	£108,506
Federated Malay States	6,699,800	523,362	5,208,900	216,376
British India	747,100	56,787	402,400	15,384
Ceylon and dependencies	5,403,300	417,758	2,574,300	106,743
Other Dutch possessions in Indian Seas	996,600	79,818	675,400	26,667
Dutch East Indies (except other Dutch possessions in Indian Seas)	811,800	58,209	945,400	41,218
Other countries in East Indies and Pacific, not elsewhere specified	300,400	22,971	191,100	9,248
Brazil	1,462,600	104,272	399,200	16,424
South and Central America (except Brazil and Peru)	86,200	6,105	900	34
West Africa				
French West Africa	9,500	602	400	15
Gold Coast	34,200	2,904	.....	.....
Other parts of West Africa	40,400	2,560	.....	.....
East Africa, including Madagascar	69,200	5,189	700	28
Other countries	58,900	4,236	10,600	479
Totals	24,731,000	£1,887,163	12,916,600	£541,122
Waste and reclaimed rubber	571,400	13,331	22,000	363
Gutta percha and balata	363,100	113,439	579,100	95,104
Rubber substitutes	13,300	777	.....	.....
Totals, unmanufactured	25,678,800	£2,014,710	13,517,700	£636,589
MANUFACTURED				
Boots and shoes *doz. pairs*	27,627	£77,443	4,239	£15,590
Waterproof clothing	.....	2,257	.....	1,855
Insulated wire	.....	1,626	.....	6,636
Tires and tubes	.....	488,580	.....	387,325
Other rubber manufactures	.....	81,466	.....	64,928
Totals, manufactured	.....	£651,372	.....	£476,334

Exports

	1920 Pounds	Value	1921 Pounds	Value
UNMANUFACTURED				
Waste and reclaimed rubber	910,200	£24,474	469,300	£8,024
Rubber substitutes	136,800	6,269	84,400	2,005
Totals, unmanufactured	1,047,000	£30,743	553,700	£10,029
MANUFACTURED				
Boots and shoes *doz. pairs*	17,593	£40,774	11,479	£24,723
Waterproof clothing	.....	378,589	.....	105,521
Insulated wire	.....	149,492	.....	59,368
Submarine cables	.....	144,411	.....	9,373
Tires and tubes	.....	504,053	.....	171,476
Other rubber manufactures	.....	425,435	.....	208,450
Totals, manufactured	.....	£1,542,754	.....	£578,911

Exports—Colonial and Foreign

	1920 Pounds	Value	1921 Pounds	Value
UNMANUFACTURED				
Crude rubber				
To Russia	1,000	£94	600	£30
Sweden, Norway and Denmark	93,700	8,303	180,200	6,277
Germany	1,218,000	84,536	2,051,400	70,526
Belgium	128,900	11,207	255,400	9,694
France	1,037,300	84,345	3,075,500	122,350
Spain	24,000	2,005	62,600	2,492
Italy	114,800	10,000	585,300	24,390
Austria-Hungary	144,300	11,591	10,500	249
Other European countries	259,500	23,924	1,271,200	42,791
United States	74,300	5,518	6,900,100	256,296
Canada	100,600	6,375	123,100	5,305
Other countries	50,600	4,247	10,400	458
Totals	3,247,000	£252,145	14,526,300	£540,858
Waste and reclaimed rubber	1,800	90	2,900	51
Gutta percha and balata	66,500	11,570	56,600	6,678
Totals, unmanufactured	3,315,300	£263,805	14,585,800	£547,587
MANUFACTURED				
Boots and shoes *doz. pairs*	269	£1,390	329	£928
Waterproof clothing	.....	.....	.....	90
Insulated wire	.....	.....	.....	141
Tires and tubes	.....	5,827	.....	33,989
Other rubber manufactures	.....	2,863	.....	3,316
Totals, manufactured	.....	£10,080	.....	£38,464

London and Liverpool Crude Rubber Imports and Exports

1921	Week Ended Nov. 5	Nov. 12	Nov. 19	Nov. 26	Dec. 3
Imports—London					
Ceylon ..... *tons*	143	225	194	144	196
Straits	306	737	493	491	475
British India	109	23	35	126	14
Dutch East Indies	42	70	45	....	52
Siam	20	....	....	....	....
British North Borneo ...	....	32	15	....	3
Java	....	....	268	186	36
Natal	....	....	....	20	....
Total ..... *tons*	620	1,087	1,050	967	776
Exports—London:					
France ..... *tons*	159	38	285	207	479
Belgium	10	....	1	14	4
Holland	....	....	....	....	....
Germany	54	26	288	64	46
New York	658	1,407	599	427	213
Sweden	....	3	....	....	....
Italy	....	6	....	102	40
Montreal	....	20	....	....	....
Toronto	....	1	....	....	....
Spain	....	....	15	1	....
Denmark	....	....	1	....	....
Norway	....	....	5	....	3
Finland	....	....	....	5	....
Total ..... *tons*	951	1,513	1,240	820	785
Imports—Liverpool:					
Ceylon ..... *tons*	65	....	16	33	....
Straits	....	71	50	40	....
Dutch East Indies	....	60	....	15	22
Java	....	....	50	....	....
British India	....	....	....	....	55
Total ..... *tons*	65	130	116	88	77
Exports—Liverpool:					
Antwerp ..... *tons*	15	....	....	....	5
Hamburg	6	....	3	....	....
Paris	....	....	20	....	....
New York	....	....	45	20	55
Belgium	....	....	....	2	....
Spain	....	....	....	10	....
France	....	....	....	8	....
Germany	....	....	....	10	....
Total ..... *tons*	21	....	68	50	60
New Haven exports to Dieppe:					
For France ..... *tons*	30	....	....	....	....

Compiled by Lavington Bros., Limited, continental and colonial carriers, 68 and 69 Old Bailey, London, E. C. 4, England.

RUBBER STATISTICS FOR SPAIN

Imports of Crude and Manufactured Rubber

	Year Ended December 1919		1920	
	Kilos[1]	Pesetas[2]	Kilos	Pesetas
UNMANUFACTURED—				
Crude rubber, gutta percha and similar materials:				
From Argentina	69,829		3,737	
Brazil	112,871		38,940	
United States	7,598		240,058	
France	2,419,430	24,443,685	2,014,813	27,132,170
Great Britain	573,222		1,366,966	
Peru	2,834		3,242	
Asia	186,542		251,509	
Other countries	387,841		254,915	
Totals	3,760,567	24,443,685	4,174,180	27,132,170
MANUFACTURED—				
Hose and tubes	65,844	618,934	153,039	1,438,567
Belting and packing	57,890	628,106	116,456	1,263,548
Solid tires armed with metal:				
From Germany	....		53,987	
United States	85,135		225,241	
France	106,941	2,441,395	327,871	7,506,592
Great Britain	189,255		532,310	
Other countries	137		33,496	
Tires and tubes:				
From Germany	....		5,405	
Belgium	13,173		14,035	
United States	235,794		676,249	
France	260,648	13,630,589	470,236	28,208,329
Great Britain	164,910		227,954	
Switzerland	....		181	
Other countries	34,736		52,521	
Shoe elastic, garters, suspenders	28,283	551,518	64,218	1,252,251
Waterproofed fabrics in pieces or cut out	45,140	880,230	104,951	2,046,544
Rubberized clothing, sewn or not	4,826	146,469	20,948	635,772
Footwear, combined or not with other materials	63,921	1,038,716	104,036	1,690,585
Rubberized hat linings	7,736	30,944	19,650	79,600
Other goods, excepting toys, instruments and writing materials	9,518	309,335	21,794	708,305

Exports

	Year Ended December 1919		1920	
	Kilos[1]	Pesetas[2]	Kilos	Pesetas
Rubber in sheets	24,140	289,680	18,826	225,912
Rubber in other forms	78,638	1,415,484	90,536	1,629,648

[1] One kilo equals 2.2 pounds.
[2] One peseta equals $0.193 (normal).

RUBBER STATISTICS FOR ITALY

Imports of Crude and Manufactured Rubber

	Six Months Ended June 1920		1921	
	Quintals[1]	Lire[2]	Quintals	Lire
UNMANUFACTURED—				
Crude rubber and gutta percha—				
raw and reclaimed:				
From Great Britain	185		313	
Netherlands	....		2,723	
French Colonies in Asia	2,075		177	
British India and Ceylon	3,659		527	
Dutch East Indies	....	45,025,400	968	33,049,800
Straits Settlements	15,119		17,690	
French African Colonies	578		....	
Belgian Congo	1,184		....	
Brazil	9,075		736	
Other countries	286		473	
Totals	32,161	45,025,400	23,607	33,049,800
Rubber scrap	136	20,400	157	23,550
Totals, unmanufactured	32,297	45,045,800	23,764	33,073,350
MANUFACTURED—				
India rubber and gutta percha—				
Threads	197	768,300	159	620,100
Sheets, including hard rubber	90	259,700	130	363,900
Tubes	114	309,800	376	701,500
Belting	489	1,271,400	185	481,000
Rubber-coated fabrics *pieces*	489	1,884,900	265	1,541,900
Boots and shoes *pairs*	75,578	1,889,450	7,473	186,825
Elastic webbing	282	1,269,000	628	2,826,000
Clothing and articles for travel	114	1,368,000	64	768,000
Tires and tubes—				
From Belgium	632		139	
France	2,485		2,476	
Great Britain	4,593	31,062,500	797	13,174,000
United States	1,140		147	
Other countries	25		205	
Other manufactures	11,318	27,944,300	2,543	6,341,800
Totals, manufactured	.....	68,027,350	.....	27,005,025
Total imports	.....	113,073,150	.....	60,078,375

Exports of Crude and Manufactured Rubber

UNMANUFACTURED—				
India rubber and gutta percha—				
raw and reclaimed:				
To Austria	300		100	
France	239		3,079	
Spain	622	3,217,250	333	3,294,600
United States	2,340		....	
Other countries	284		364	
Totals	3,785	3,217,250	3,876	3,294,600
Waste	5,638	1,127,600	913	182,600
Totals, unmanufactured	9,423	4,344,850	4,789	3,477,200
MANUFACTURED—				
India rubber and gutta percha—				
Threads	194	373,000	202	909,000
Sheets, including hard rubber	196	453,000	197	498,800
Tubes	938	1,699,000	1,008	1,776,300
Belting	.....	.....	7	21,000
Rubber-coated fabrics *pieces*	203	607,400	114	241,600
Boots and shoes *pairs*	445	15,575	100	3,500
Other footwear	2	5,000	2	5,000
Elastic webbing	747	4,033,800	455	2,457,000
Clothing and articles for travel	291	4,365,000	47	705,000
Tires and tubes:				
To Austria	1,407		947	
Belgium	830		1,237	
Czecho-Slovakia	546		151	
Denmark	981		74	
France	1,256		1,195	
Great Britain	6,332		4,667	
Netherlands	366		397	
Rumania	670		784	
Spain	346	106,416,000	630	60,824,000
Switzerland	362		372	
Hungary	233		1	
India and Ceylon	3,637		786	
Dutch East Indies	1,444		740	
Straits Settlements	1,436		84	
Australia	611		.....	
Argentina	1,854		1,297	
Brazil	1,405		127	
Other countries	2,888		1,717	
Other rubber goods	6,755	20,897,200	8,920	27,881,900
Totals, manufactured	.....	139,364,975	.....	95,423,100
Total exports	.....	143,709,825	.....	98,900,300

[1] One quintal equals 220.46 pounds.
[2] One lira equals $0.193 (normal).

THE MARKET FOR RUBBER SCRAP

New York

Some business is being done in rubber scrap at low prices although the activity is confined largely to boot and shoe grades and mixed tires. Early in the month boots and shoes were fairly active at 3.40 to 3.50 cents a pound delivered followed by a temporary rise to 3.75 to 4 cents. Mixed tires have ruled from $15 a ton in the West to $16 to $18 in New York and $20 to $22 in New England.

The demand for inner tubes is quiet at about $3.25 to $3.50 per 100 pounds for No. 1 grade.

Mechanical grades are practically without value.

The National Association of Waste Material Dealers announced that it has secured a lower classification for scrap rubber. The examiner has filed his recommendation for sixth-class rate, the present rate being fifth-class. Final decision rests with the Commission.

Quotations for Carload Lots Delivered

December 23, 1921

Prices subject to change without notice

Boots and Shoes			
Boots and shoes	lb.	$0.03½ @	.03¾
Trimmed arctics	lb.	.02¾ @	
Untrimmed arctics	lb.	.02¼ @	
Hard Rubber			
Battery jars, black compound	lb.	*.07½ @	
No. 1, bright fracture	lb.	*.12 @	.15
Inner Tubes			
No. 1	lb.	.04¼ @	
Compounded	lb.	.03¾ @	
Red	lb.	.03½ @	
Mechanicals			
Black scrap, mixed, No. 1	lb.	*.02¼ @	.03
No. 2	lb.	*.01½ @	.02
Heels	lb.	*.02½ @	.03
Horse-shoe pads	lb.	*.02½ @	.03
Hose, air brake	lb.	*.01 @	.01½
fire, cotton lined	lb.	*.01 @	
garden	lb.	.07 @	
Matting	lb.	*.01 @	
Red packing	lb.	*.04½ @	.05
Red scrap, No. 1	lb.	*.07 @	.08
No. 2	lb.	*.05½ @	.06
White scrap, No. 1	lb.	*.07 @	.07½
No. 2	lb.	.06 @	.06½
Tires			
Pneumatic—			
Auto peelings	lb.	.01½ @	
Bicycle	lb.	.01 @	.01¼
Standard white auto	lb.	*.02¼ @	.02¾
Mixed auto	lb.	.00¾ @	.01
Stripped, unguaranteed	lb.	*.01 @	.01½
White, G. & G., M. & W., and U. S.	lb.	*.02¼ @	
Solid—			
Carriage	lb.	*.02¼ @	.02¼
Iron	lb.	@	
Truck, clean	lb.	*.01½ @	.02

*Nominal.

THE MARKET FOR COTTON AND OTHER FABRICS

New York

AMERICAN COTTON. Spot middling cotton rose nearly to 19 cents on November 25, rapidly falling off with occasional small recoveries to 17½ cents on December 1. From this point it had recovered to a little over 18 cents on December 12, from which it dropped again below 17¾ within a few days, promptly and rapidly rising to 19 cents on December 20 easing off within a week to 18½ cents.

The world production of commercial cotton for 1921-22 is placed at 15,593,000 bales by the United States Agricultural Department's report, issued December 22. This is the smallest crop since 1900. It compares with 20,650,000 bales in 1920, and with a ten year average of 20,773,000 bales of 500 pounds gross weight, based on census figures of the total world commercial crop.

Under normal conditions of consumption this year's American and Egyptian crops would be considered disastrous. The reduced demand for cotton cloth by Russia, Turkey and other European countries owing to their financial disability has curtailed the demand for raw cotton.

Buying of cotton goods by the rubber manufacturing trade has been in reduced volume with prospects good for increased demand early in the New Year.

EGYPTIAN COTTON. Upper Egyptian cotton has fluctuated recently within rather narrow limits and medium grades can be bought in Boston at between 31 and 33 cents. Cable advices from Egypt state that the stock of upper Egyptian cotton outside of exporters, importers and mill stocks probably does not exceed 10,000 bales. Sakellarides prices hold remarkably firm and medium grades are worth 34 to 37 cents ex duty. There is very little of this cotton coming to the United States, probably less than 8,000 bales have been imported since the seven-cent duty became effective last May.

SEA ISLAND COTTON can be bought around 44 cents for average extra choice. The supply of this cotton is slowly dwindling. The present crop will probably be about 4,000 bales.

ARIZONA COTTON. Pima cotton is relatively very cheap having sold as low as 34 cents. Recent government ginning figures indicate a crop of less than 30,000 bales.

MECHANICAL DUCKS AND DRILLS. The market is showing increased buying activity, large factors showing more interest in futures. A strong market should rule over the January-March period.

RAINCOAT CLOTHS. Prices have not changed and business is very quiet and with few inquiries.

SHEETING. Buying is very limited, although there is a firmer tone to the market. Very wide sheetings, 57 inches and up, have been selling freely but narrower cloths are quiet.

TIRE FABRICS. There has been very little call for fabric, probably due to the general desire to make annual statements show as good conditions as possible by reporting small inventories. Tire dealers have adopted the same policy and prevailing small stocks would indicate good business for the spring tire demand. The general opinion is that raw cotton will move to considerably higher levels, particularly Egyptians which go largely into tires. The low market is thought to have been passed thirty days ago.

New York Quotations

December 23, 1921

Prices subject to change without notice

Burlaps			
36—8-ounce		$3.85	@$3.90
40—7-ounce		3.80	@ 3.85
40—7½-ounce		4.05	@ 4.10
40—8-ounce		4.10	@ 4.15
40—10-ounce		4.80	@ 4.85
40—10½-ounce		4.90	@ 4.95
Drills			
38-inch 2.00-yard	yard	.17½ @	
40-inch 3.47-yard		.10¾ @	
52-inch 1.90-yard		.19½ @	
52-inch 1.95-yard		.19 @	
60-inch 1.52-yard		.24¾ @	
Duck			
Carriage Cloth			
38-inch 2.00-yard enameling duck	yard	.18½ @	
40-inch 1.47-yard		.24½ @	
72-inch 16.66-ounce		.40 @	
72-inch 17.21-ounce		.41¾ @	

Mechanical

Hose	pound	$0.35	@
Belting		.35	@

Hollands, 40-inch

Acme	yard		@
Endurance			@
Penn			@

Dead Finish

Piece			@
Cut			@
Standard, 36-inch, white		.16	@
36-inch, colors		.17	@
42-inch, white		.18	@
42-inch, colors		.19	@

Flat Finish

Piece			@
Cut			@
Imperial, 36-inch, white		.14	@
36-inch, colors		.15	@
42-inch, white		.16	@
42-inch, colors		.17	@

Lonsdale

White, piece			@
cut			@
Colors, piece			@
cut			@
Green and blue, piece			@
cut			@

Nainsooks

White			@
Flesh			@

Raincoat Fabrics

Cotton

Bombazine 64 x 60	yard	.13	@	
60 x 48		.11½	@	
Cashmeres, cotton and wool, 36-inch, tan		.55	@	
Twills 64 x 72		.10	@	.12
60 x 102		.14	@	
Twill, mercerized, 36-inch, blue and black		.26½	@	
tan and olive		.25	@	
Tweed		.20	@	1.00
printed		.15	@	
Plaids 60 x 48		.12½	@	
56 x 44		.11¼	@	
Repp			@	
Prints 60 x 48		.13	@	
64 x 60		.14	@	

Sheetings, 40-inch

48 x 48, 2.50-yard	yard	.13¼	@
48 x 48, 2.85-yard		.12	@
64 x 68, 3.15-yard		.13	@
56 x 60, 3.60-yard		.11¼	@
48 x 44, 3.75-yard		.10	@

Silks

Canton, 38-inch	yard	.29½	@
Schappe, 36-inch		.45	@

Stockinettes

Single Thread

3½ Peeler, carded	pound		@
4½ Peeler, carded			@
6½ Peeler, combed			@

Double Thread

Zero Peeler, carded	pound		@
3½ Peeler, carded			@
6½ Peeler, combed			@

Tire Fabrics

Building

17¼-ounce Sakellarides, combed	pound	1.00	@	
17¼-ounce Egyptian, combed		.80	@	.85
17¼-ounce Egyptian, carded		.75	@	.85
17¼-ounce Peelers, combed		.80	@	.85
17¼-ounce Peelers, carded		.55	@	.60

Cord

15-ounce Egyptian	pound	.85	@	.90

Bicycle

8-ounce American	pound		@
10-ounce American			@

Chafer

9¼-ounce Sea Island	pound		@	
9¼-ounce Egyptian, carded		.86	@	.90
9¼-ounce Peeler, carded		.68	@	.70

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS

New York

The demand in general by the rubber trade for compounding ingredients has been moderate in view of the approach of the customary annual inventory period. Prices are firm at rock-bottom levels. Importers have been offering German made lithopone at 4¼ cents a pound and urging consumers to purchase because of the probability of a duty being placed on this material, but speculative stocks are not being built up on that probability.

The leading domestic producers of lithopone have not lowered quotations to meet this foreign competition. German lithopone that has been imported since the war is below the standard set by American producers.

ANILINE. The demand has been rather light but prices have held firm from 18 to 20 cents a pound.

ANTIMONY SULPHIDES. Active rubber trade business is due after January first.

BARYTES. The market has been steady in both demand and price. Early in the month there was an increase in importation of foreign barytes.

BENZOL. The long prevailing shortage is rapidly disappearing. Early in the month there were 3,000 coke ovens in operation and production was estimated at 50 per cent of normal with full pro-

duction anticipated in another month. The demand is, however, still in excess of the supply for the time being.

BLANC FIXE. The situation follows that of barytes. Business is routine.

CADMIUM SULPHIDE. There is no active call. Price is steady at $1.85 a pound.

CARBON BISULPHIDE. The heavy demand prevailing about the middle of November fell off early in December to moderate proportions. The price has remained firm at 6 to 7½ cents a pound.

CARBON TETRACHLORIDE. The market was very quiet up to the middle of December at which time inquiries from the rubber trade became numerous and important. The ruling quotations were 10½ to 12 cents a pound.

CHINA CLAY. There is a well sustained inquiry for the imported material which has the advantage over domestic china clay due to excessive freight rates on the latter.

DRY COLORS. The business in dry colors has ranged from fair to good and prices steady.

GAS BLACK. This material has met with good demand, which is due to assume increased proportions with the larger output of automobile tires planned for early in the New Year.

LITHARGE. Business from the rubber trade has been restricted to routine proportions and prices have remained practically unchanged.

LITHOPONE. Foreign competition has been ineffective in reducing the quotation on domestic lithopone owing to the well-known superior quality of the latter product.

SOLVENT NAPHTHA. The demand has been somewhat irregular and at times has exceeded the supply.

SUBLIMED LEAD. The market has been similar to that for litharge, with routine business and prices fixed.

SULPHUR. A quiet market has prevailed with commercial flour quoted $1.45 to $2.10 a 100 pounds. Among rubber manufacturers contracts are made about this time for the next year's needs.

SULPHUR CHLORIDE. The call has been slight. Prices from 5 to 6 cents a pound.

TALC. Both foreign and domestic grades have had a good market.

WHITING. Stocks have run light, prices steady and business was good during the month. Commercial quoted at $1.10 a 100 pounds.

ZINC OXIDE. Little imported zinc oxide is arriving. Demand from tire industry has not been large in order that they may come to their inventory period with small stocks. A marked improvement in business from tire makers is expected early in the New Year.

New York Quotations

December 23, 1921

Prices subject to change without notice

Accelerators, Organic

Accelerene (f. o. b. English port)	lb.	13s.	@	
Adeo	lb.	$0.75	@	
Aldehyde ammonia crystals	lb.	.90	@	.95
Aniline (f. o. b. factory)	lb.	.17	@	.22
Excellerex	lb.	.50	@	.65
Formaldehyde aniline	lb.	.45	@	.50
Hexamethylene tetramine	lb.	.75	@	.80
Lead oleate (400 lb. bbls. factory)	lb.	.20	@	
N. C. C.	lb.	.35	@	.40
No. 999	lb.	.14	@	
Paradin	lb.	.41	@	
Paranitroso dimethylaniline	lb.		@	
Paraphenylene diamine	lb.	1.60	@	1.75
Thiocarbanilide	lb.	.35	@	.40
Vul Ko Cene	lb.	.35	@	
X L O	lb.	1.50	@	

Accelerators, Inorganic

Lead, dry red	lb.	.08	@	.08¼
sublimed white	lb.	.06½	@	
white, basic carbonate	lb.	.06½	@	.07½
Lime, flour	lb.	.02	@	.02½
Litharge, domestic	lb.	.08½	@	
imported	lb.	.17	@	
Orange mineral	lb.	.11	@	.13
Magnesium, carbonate, light	lb.	$0.06	@	$0.09½
calcined light (bbls.)	lb.	.25	@	.30
extra light (bbls.)	lb.	.50	@	
medium light (bbls.)	lb.	.25	@	
calcined heavy (bbls.)	lb.	.06	@	.07½

Acids

Acetic 28 per cent (bbls.)	cwt.	2.50	@	3.00
glacial, 99 per cent.	cwt.	10.00	@	10.75
Cresylic (97% straw color, drums)	gal.	.70	@	
(95% dark, drums)	gal.	.65	@	
Muriatic, 20 degrees	cwt.	1.40	@	2.00
Nitric, 36 degrees	cwt.	5.25	@	6.25
Sulphuric, 66 degrees	ton	17.00	@	18.00

Alkalies

Caustic soda	cwt.	3.75	@	4.00
Soda ash, 58% (bbls.)	cwt.	2.15	@	2.20

Colors

Black

Bone, powdered	lb.	.05½	@	.07½
Carbon black	lb.	.10½	@	.20
pressed	lb.	.12½	@	.16
Dipped goods	lb.	1.00	@	
Drop	lb.	.07½	@	.16
Ivory black	lb.	.15	@	.45
Lampblack	lb.	.15	@	.45
Micronex	lb.	.12	@	.15
Oil soluble aniline	lb.	.50	@	
Rubber black	lb.	.10	@	.16

Blue

Cobalt	lb.	.27	@	.35
Dipped goods	lb.	1.00	@	
Prussian	lb.	.50	@	
Rubber makers' blue	lb.	3.50	@	
Ultramarine	lb.	.16	@	.35

Brown

Iron oxide	lb.	.04	@	.05
Sienna, Italian, raw and burnt	lb.	.04½	@	.05¼
Umber, Turkey, raw and burnt	lb.	.04¼	@	.05¾
Vandyke	lb.	.03½	@	.05

Green

Chrome, light	lb.	.30	@	.32
medium	lb.	.35	@	.36
dark	lb.	.36	@	.45
commercial	lb.	.12	@	
tile	lb.	.11	@	13
Guignet	lb.	1.50	@	
Dipped goods	lb.	1.00	@	
Oxide of chromium	lb.	.50	@	.60

Red

Antimony, crimson	lb.	.38	@	.44
crimson, 15/17% (bbls.)	lb.	.55	@	
crimson, F.	lb.	.40	@	
crimson, R. M. P.	lb.	.48	@	
Antimony, golden	lb.	.20	@	.30
golden, R. M. P.	lb.	.20	@	
golden 1	lb.	.30	@	
golden 2	lb.	.25	@	
golden, 15/17% (bbls.)	lb.	.25	@	
7-A	lb.	.35	@	
vermilion	lb.	.55	@	
red sulphuret	lb.	.20	@	
Arsenic, red sulphide	lb.	.11	@	.12
Cadmium, sulphide	lb.	1.85	@	
Dipped goods, red	lb.	1.00	@	
purple	lb.	1.00	@	
orange	lb.	1.00	@	
Indian	lb.	.08	@	.14
Iron oxide, reduced grades	lb.	.03	@	.13
pure bright	lb.	.05	@	.14
Maroon oxide	lb.	.08	@	.14
Oil soluble aniline, red	lb.	1.70	@	1.95
orange	lb.	1.45	@	
Oximony	lb.	.16	@	
Para toner	lb.	1.40	@	
Spanish natural	lb.	.04	@	.05
Toluidine toner	lb.	2.50	@	2.75
Venetian	lb.	.02½	@	.05
Vermilion, American	lb.	.25	@	.30
English quicksilver	lb.	.85	@	.88

White

Albalith	lb.	.06	@	.06½
Aluminum bronze	lb.	.55	@	.60
Lithopone, Beckton white	lb.	.06	@	.06½
Lithopone, domestic (factory)	lb.	.06	@	.06½

		C.L.		L.C.L.
Zinc oxide, American Horse Head (factory):				
Special	lb.	.08	@	.08½
XX red	lb.	.07½	@	.08
French process, Florence brand (factory):				
White seal	lb.	.11	@	.11¼
Green seal	lb.	.09¾	@	.10¼
Red seal	lb.	.08¾	@	.09½
White seal	lb.	.11	@	.11¼
Azo (factory):				
ZZZ (lead free)	lb.	.07½	@	.08
ZZ (under 5% leaded)	lb.	.07¼	@	.07¾
Z (8-10% leaded)	lb.	.07	@	.07½

Yellow				
Arsenic, yellow sulphide	lb.	$1.00	@	
Cadmium, sulphide	lb.	1.25	@	1.85
Chrome, light and medium	lb.	.18	@	
C. P.	lb.	.20	@	
Dipped goods	lb.	1.00	@	
Ochre, domestic	lb.	.02½	@	.03½
imported	lb.	.02¾	@	.03¾
Oil soluble aniline	lb.	1.55	@	
Zinc yellow	lb.	.33½	@	

Compounding Ingredients

Aluminum flake (carloads)	ton	25.00	@	29.45
hydrate, light	lb.	.20	@	.22
Ammonium carbonate	lb.	.08½	@	.13
Asbestine	ton	20.00	@	25.00
Barium, carbonate	ton	48.00	@	50.00
dust	ton	100.00	@	
Barytes, pure white (carloads)	ton	23.90	@	28.00
off color (carloads)	ton	20.00	@	
uniform floated (carloads)	ton	23.90	@	
Basofor	lb.	.04½	@	
Beta-naphthol	lb.	.32	@	
Blanc fixe	lb.	.03½	@	.04½
Bone ash	lb.		@	
Carrara filler (factory)	ton	18.00	@	
Chalk, precipitated, extra light (f. o. b. factory)	lb.	.03½	@	.04½
heavy (f. o. b. factory)	lb.	.02½	@	.03¼
China, clay, Dixie	ton	22.00	@	32.00
Blue Ridge	ton	22.00	@	32.00
domestic, lump (f. o. b. factory)	ton	7.50	@	9.00
imported, lump	ton	16.00	@	24.00
Cotton linters, clean mill run	lb.	.04¼	@	
Fossil flour (powdered)	ton	60.00	@	
(bulted)	ton	65.00	@	
Glue, high grade	lb.	.30	@	.40
medium	lb.	.22	@	.28
low grade	lb.	.15	@	.18
Graphite, flake	lb.	.10	@	
amorphous	lb.	.05	@	
Infusorial earth (powdered)	ton	60.00	@	
(bolted)	ton	65.00	@	
Liquid rubber	lb.	.15	@	
Mica, powdered	lb.	.15	@	
Pumice stone, powdered	lb.	.01	@	.05
Rotten stone, powdered (bbls.)	lb.	.02½	@	.04½
Silica, aluminum	ton	22.50	@	23.50
gold bond	ton	25.00	@	
silver bond	ton	20.00	@	
Soap bark, cut	lb.	.09	@	.10
Soapstone, powdered-gray (carloads)	ton	12.00	@	
Starch, powdered corn (bags)	cwt.	1.93	@	
(bbls.)	cwt.	2.21	@	
Talc, soapstone	ton	22.50	@	
Terra blanche	ton	23.00	@	25.00
Tripoli flour, air-floated, cream or rose (factory)	ton		@	
white (factory)	ton		@	
Tyre-lith	ton		@	
Whiting, Alba	cwt.	15.00	@	18.00
commercial (carloads)	cwt.	1.05	@	1.10
Danish	ton	14.00	@	
English cliffstone (carloads)	cwt.	1.60	@	1.75
gilders	cwt.	1.20	@	1.35
Paris, white, American (carloads)	ton	16.00	@	
Quaker	ton	13.00	@	15.00
Wood pulp, XXX (f. o. b. factory)	ton	30.00	@	
X (f. o. b. factory)	ton	25.00	@	

Mineral Rubber

		C.L.		L.C.L.
Gilsonite	ton	70.00	@	
Genasco (factory)	ton	50.00	@	52.00
Hard hydrocarbon	ton	35.00	@	42.00
Soft hydrocarbon	ton	33.00	@	38.00
320/340 M. P. hydrocarbon (factory)	ton	47.50	@	50.00
300/310 M. P. hydrocarbon (factory)	ton	42.50	@	45.00
Pioneer, M. R.	ton	38.00	@	65.00
Robertson, M. R. (factory)	ton	52.50	@	60.00
Rubrax (factory)	ton	50.00	@	
States "A"	ton	45.00	@	
No. 1	ton	40.00	@	
Synpro, granulated, M. R. (factory)	ton	54.50	@	64.50

Oils

Avoilas compound (bbls.)	lb.	.14	@	
Castor, No. 1, U. S. P.	lb.	.12	@	
No. 3, U. S. P.	lb.	.11	@	
Corn	lb.	.09½	@	.09½
refined (bbls.)	lb.	.10½	@	.10¾
Cotton	lb.	.10	@	
Glycerine (98 per cent)	lb.	.14½	@	.15
Halowax	gal.	.25	@	.27
Linseed, raw, domestic	lb.	.09	@	
imported	gal.	.60½	@	.63
Palm, niger	lb.	.08	@	
Peanut	lb.	.11	@	
Petrolatum, standard	lb.	.06	@	.10
Petrolatum, sticky	lb.	.10	@	.12
Pine, steam distilled	gal.	1.05c	@	
Rapeseed, refined	lb.	.11¾	@	
blown	lb.	.12¾	@	
Rosin	gal.	.36	@	.45
Synpro	gal.	.38	@	.60
Soya bean (bbls.)	lb.	.09½	@	
Tar	gal.			.16c

Resins and Pitches

Cumar resin, hard	lb.	$0.09	@	$0.12
soft	lb.	.09	@	.12
Tar, retort	bbl.	10.50	@	
kiln	bbl.	9.50	@	
Pitch, Burgundy	lb.	.05	@	.06
coal tar	lb.	.01½	@	
pine tar	lb.	.03½	@	
ponto	lb.	.08	@	
Rosin, K (bbl.)	280 lbs.	6.70	@	
strained (bbls.)	280 lbs.	5.75	@	
Shellac, fine orange	lb.	.70	@	.80

Solvents

Acetone (98.99 per cent drums [6.62 lbs. per gal.])	lb.	.12½	@	.13½
Benzol (90%, drums [7.21 lbs. per gal.])	gal.	.25	@	.31
pure (drums)	gal.	.27	@	.36
Carbon bisulphide (drums [10.81 lbs. per gal.])	lb.	.07	@	.07¾
tetrachloride (drums [13.28 lbs. per gal.])	lb.	.10½	@	.12¼
Paracymene (factory)	gal.	.25	@	.50
Motor gasoline (steel bbls.)	gal.	.27	@	
Naphtha, V. M. & P. (steel bbls.)	gal.	.24	@	
solvent (drums extra)	gal.	.26	@	
Toluol, pure (7.21 lbs. per gal.)	gal.	.28	@	.34
Turpentine, spirits	gal.	.83½	@	
wood	gal.	.80	@	
Xylol, pure (7.21 lbs. per gal.)	gal.	.40	@	.43
commercial	gal.	.28	@	.35

Substitutes

Black	lb.	.07	@	.13½
Brown	lb.	.10	@	.14
White	lb.	.08	@	.15½
Brown factice	lb.	.08	@	.15
White factice	lb.	.09	@	.16½

Vulcanizing Ingredients

Lead, black hyposulphite (black hypo)	lb.	.35	@	.45
Sulphur chloride (jugs)	lb.	.20	@	
(drums)	lb.	.09	@	
Sulphur, flour, commercial	cwt.	1.45	@	2.10
Bergenport brand, 100% pure (bbls.)	cwt.	2.55	@	
(bags)	cwt.	2.30	@	
Light 100% pure (bbls.)	240 lbs.	2.60	@	3.15
(bags)	150 lbs.	2.35	@	2.90
Superfine 99½% pure (bbls.)	210 lbs.	2.40	@	2.90
(bags)	cwt.	2.09	@	2.50

(See also Colors—Antimony).

Waxes

Wax, beeswax, white, commercial	lb.	.55	@	
ceresine, white	lb.	.12	@	
carnauba	lb.	.16	@	
Montan	lb.	.07	@	
ozokerite, black	lb.	.25	@	
green	lb.	.25	@	
paraffine	lb.	.25	@	
sweet wax	lb.	.12	@	

COSTS OF PRODUCTION IN THE LITHOPONE INDUSTRY

The United States Tariff Commission has issued a report showing the costs of production in the lithopone industry for the first six months of 1921. This report shows that the cost is greater than in 1919.

The total cost, including sales expenses, for the first six months of 1921 was found to be 6.26 cents per pound, an increase of 0.24 of a cent, or 4 per cent, over the average cost for 1919. This increase is accounted for largely by the increase in factory overhead expense per pound of lithopone, which more than offset the decrease of 0.26 of a cent per pound in direct labor and a slight decrease in selling expense. Material cost showed a small increase over that in 1919. The total cost of producing lithopone was distributed as follows: 42 per cent for raw materials, 13 per cent for direct labor, 41 per cent for factory overhead, and about 4 per cent for sales expense.

The total quantity of lithopone produced during the first half of 1921 was slightly more than 45,000,000 pounds. This is only about one-half the output during the last half of 1919, when the industry was operating at maximum capacity. Without doubt this restricted production is mainly responsible for the increase in total unit cost.

Only eight of the thirteen firms previously engaged in lithopone production were in actual operation during this period. Considering existing plants, the industry was in operation only to the extent of one-third of its capacity, and the eight firms which were operating manufactured lithopone equal to only about 40 per cent of their capacity. It is pointed out, however, that this inactivity is not due to competition from imported lithopone, as imports equaled only 2 per cent of domestic sales.

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